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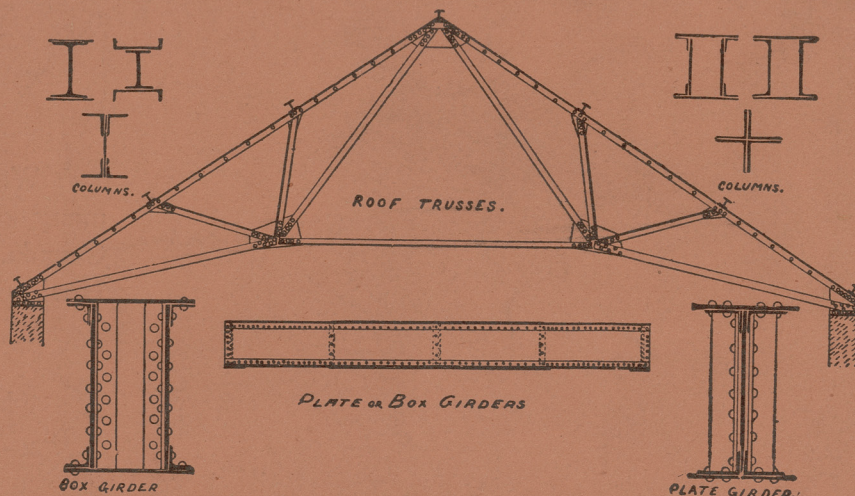
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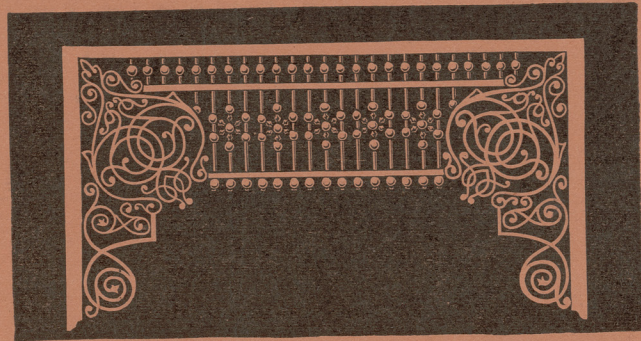
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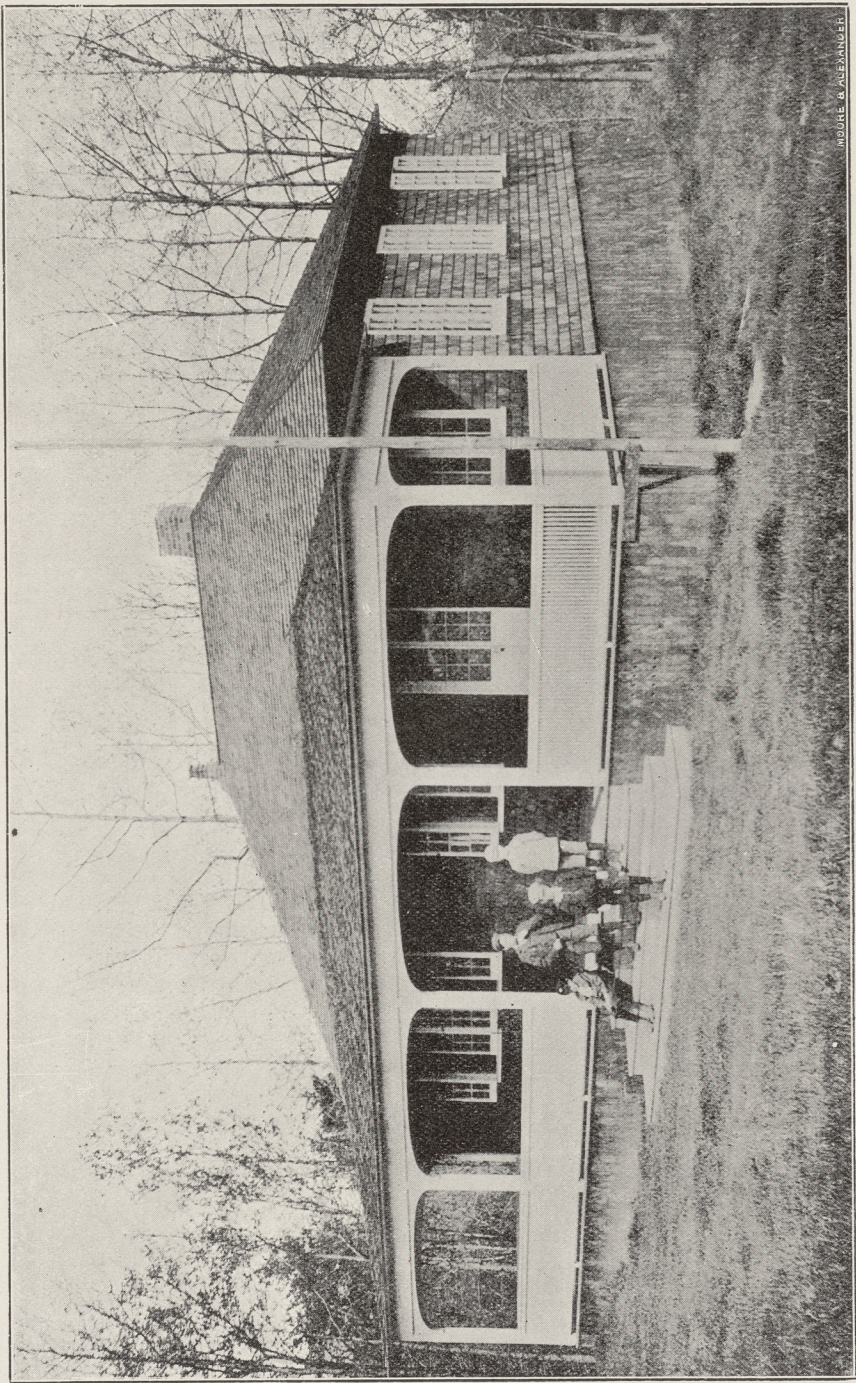
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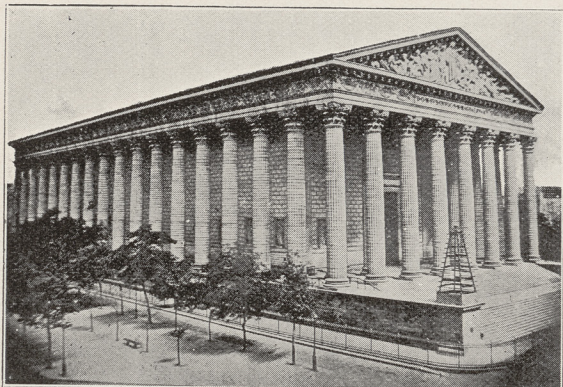
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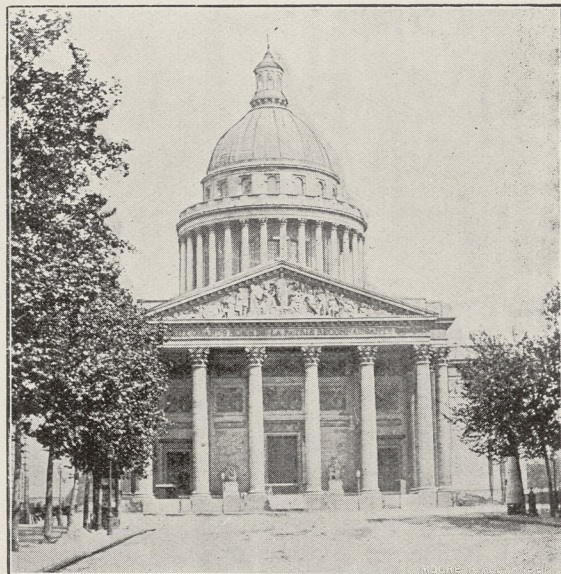


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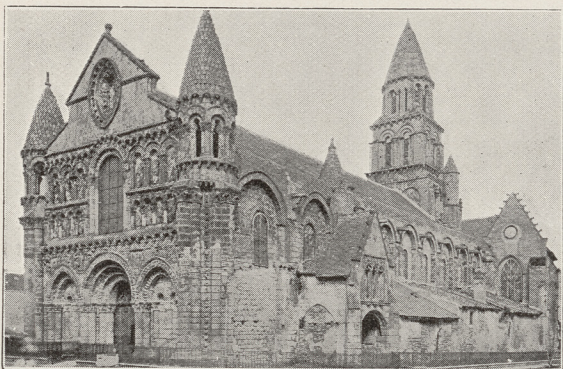




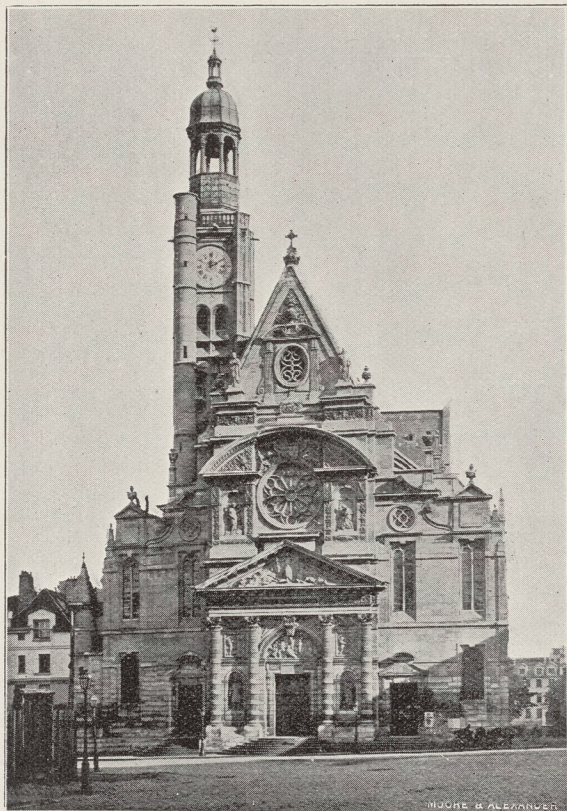
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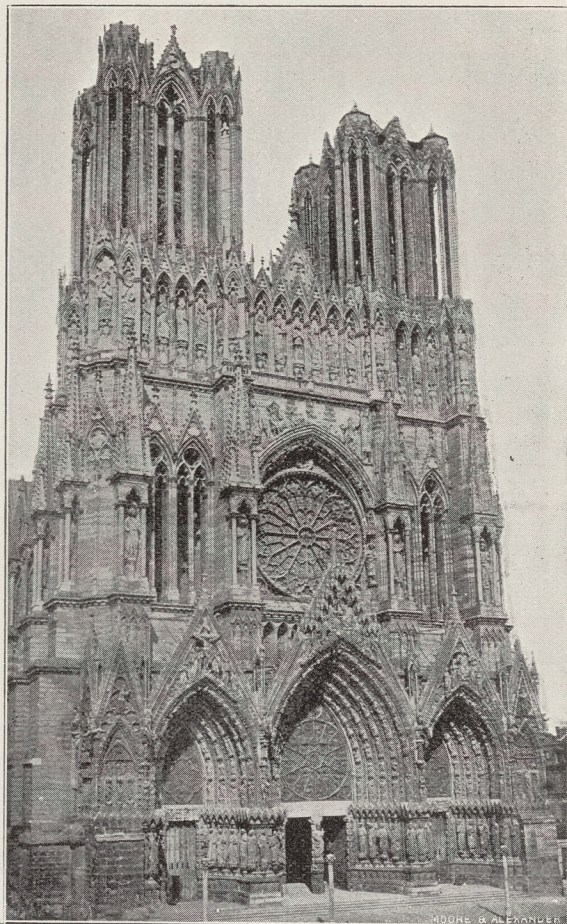
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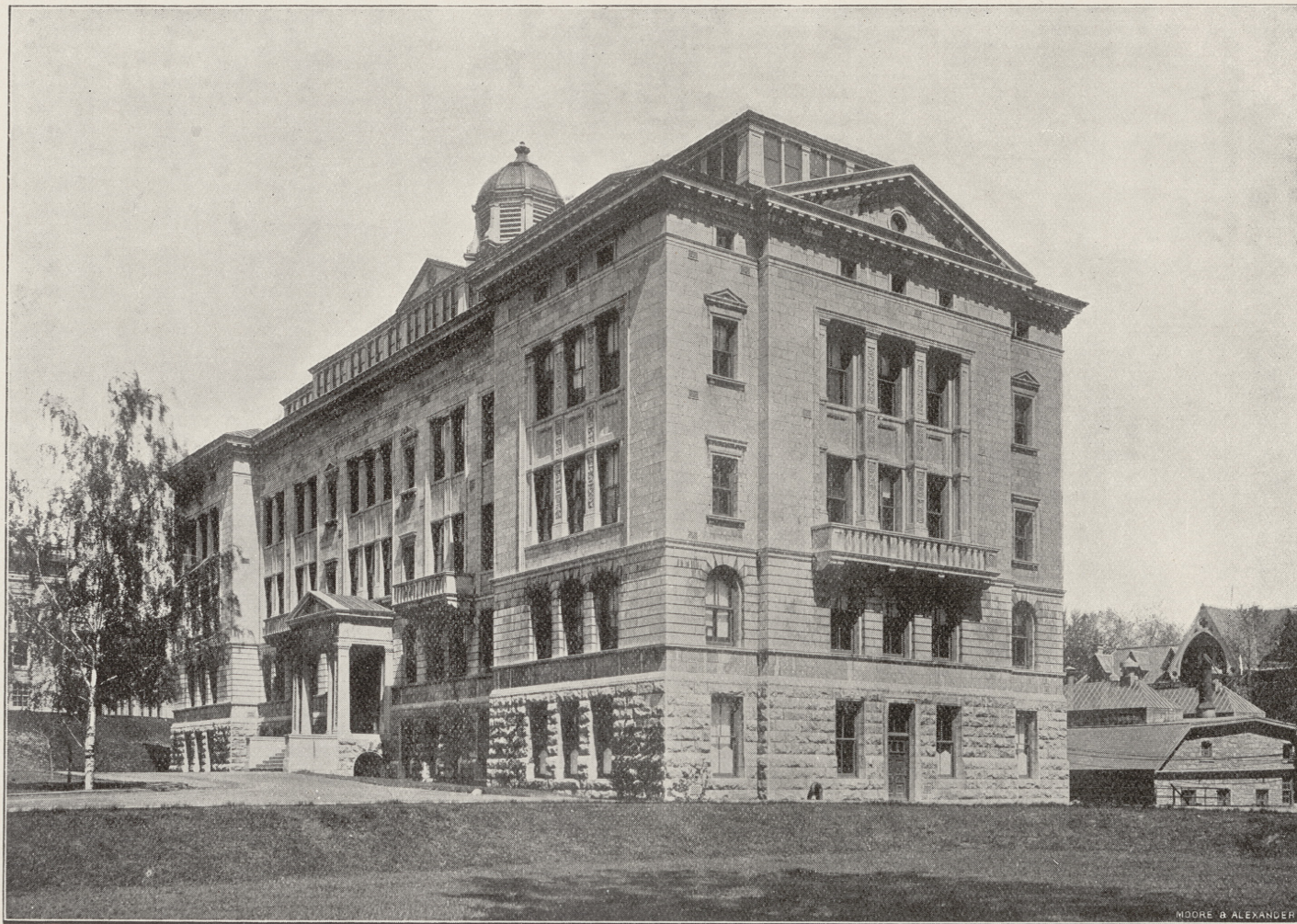
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The Builders' Edition will contain matter of a practical character to meet the requirements of persons engaged in the various building trades. Much of this matter will be illustrated in a manner to clearly explain what are believed to be the best methods of carrying out various kinds of work.

It is believed that by this change the publishers will be able to meet, in a manner more satisfactory than in the past, the requirements of both classes of

readers, and that, as a result, a larger number of subscribers will be secured.

The publication of the journal in two editions will begin with the January number.

A series of valuable articles has been secured for publication next year, which includes the following: "The Best Means of Reducing the Fire Loss in Buildings," by Edmund Burke, architect, Toronto; "Landscape Architecture," by Frederick G. Todd, Landscape Architect, Westmount, Montreal; "Planning," by S.H. Townsend, architect, Toronto; "Electrical Work as Applied to Buildings," by R. A. L. Gray, Electrical Engineer, Toronto; "Architectural Education for Canadian Students of Architecture," by Professor S. H. Capper, of the Department of Architecture, McGill University, Montreal; "Design," by J. C. B. Horwood, architect, Toronto; "Decoration and Furnishing," by W. H. Elliott, Toronto.

The authors of this series of articles have been selected with a view to their special knowledge of the subjects on which they will write. The subjects have also been carefully chosen with the object of furnishing a variety of matter calculated to interest and instruct all classes of our readers.

Other valuable articles will be published throughout the year, and every effort will be made to enhance the value of the CANADIAN ARCHITECT AND BUILDER to its readers.

Students' and Draughtsmen's Competitions.

THE attention of Canadian architectural students is again directed to the Students' and Draughtmen's competitions, particulars of which are printed in the Students' Department of this issue. These competitions are organized for the purpose of developing students' and draughtmen's knowledge of drawing and design, thus fitting them for the successful practice of their profession in years to come. It is earnestly hoped that students will show their appreciation of the object of these competitions, and encourage their continuance by participating in them to a larger extent than heretofore. Architects are requested to bring the competitions to the notice of their students and draughtsmen and encourage them to enter.

Manual Training

REFERENCE has been made on more than one occasion to the opposition manifested by the Trades and Labor Council of Toronto to the introduction of manual training in the public schools. We have never been able to understand why the representatives of skilled labor should oppose a movement which is so manifestly calculated to confer benefit upon their children. It is perhaps fair to assume that in the majority of cases the ranks of mechanics are replenished by the children of mechanics. How can it be an injury to the parents of these children that their offspring should have the opportunity in the public schools to obtain a knowledge of the use of tools and the theory of mechanics? If there is any benefit whatever to be gained from educating the eye and hand of the child, surely it is the working class who will receive the larger advantage. There has been a well founded objection made that the course of education in the public schools of Canada in the past was calculated to develop clerks and professional men rather than mechanics. Now, when a well thought out plan of manual training in the schools is put in operation through the

philanthropy of Mr. W. C. McDonald, we have the spectacle of the Trades and Labor Council resolving to establish a labor paper with the principal object of opposing the progress of the movement. Could anything be more shortsighted and inconsistent?

Effect of Storms on Building Construction.

THE devastation wrought at Galveston, Texas, by a cyclonic storm, affords opportunity for investigation of the character of construction best adapted to withstand extreme wind pressures. It is understood that some buildings withstood the storm. Thus the means of enquiry is at hand, and it is to be hoped that some data on this important subject will be recorded. In Canada we have had no storms approaching in velocity the one in Galveston, but of late years, as the protection afforded by the forests has gradually been diminished, our buildings have been subjected to greater wind pressures than before. Within the last month we have experienced storms in which the wind travelled at the rate of 50 miles per hour. It is proof of the substantial construction of our buildings that so few chimneys and other projecting features were dislocated. The subject of wind pressure, however, is one which should receive greater attention in the future.

Canadian Soldiers' Memorials.

REFERRING to the article and correspondence which appeared in our last issue on this subject, the objection has been made that an arch would not constitute a fitting memorial. The argument is advanced that an arch is an emblem of victory and hence is not suitable for the purpose of a memorial. This objection, which comes from a source entitling it to consideration, appears to be well taken. Probably a group of statuary would best meet the requirements. Apart from the objection which has been mentioned, a permanent arch, if executed in a creditable manner, would probably cost a larger sum than could be raised by public subscription. Owing to the absence of public squares in the heart of the city, and the arrangement of the streets at right angles to each other, it would be difficult to obtain an entirely suitable site for an arch. If the city council had purchased and fitted up as a public square the piece of land opposite the new municipal buildings, as suggested two or three years ago, this would have afforded a suitable location. We do not know whether the land is still available, but unfortunately there appears to be no disposition on the part of the city council to make the purchase. When considering the question of cost and the probable amount which could be raised for a memorial, we are reminded of the difficulties experienced by those who have in the past undertaken to raise funds for a like purpose. It is not altogether surprising that in a new country such as Canada, large subscriptions should not be forthcoming, when even a wealthy nation like the United States will not contribute largely for such an object. The failure to obtain the necessary funds for the proposed Dewey arch is a case in point. Seemingly the only means by which a really creditable memorial can be erected is by Government funds. It would be a perfectly proper thing for the Dominion Government to make an appropriation for a National memorial to be erected at Ottawa, and for the Provincial Governments to appropriate money which might be added to by public subscription for suitable memorials for the various

Provinces. It is desirable that early action be taken in this direction.

Competition for Exhibition Buildings.

THE Toronto Industrial Exhibition Association have sent out a circular inviting architects to submit competitive designs for a new main building and several subsidiary buildings to be erected on the exhibition grounds to meet the requirements of the proposed Dominion exhibition next year. The cost of the main building is estimated at \$106,000, and of the lesser buildings from \$5,000 to \$15,000 each. To the author of the accepted design for the main building a prize of \$250 is offered, and to the authors of the accepted designs for the smaller buildings prizes of \$40 and \$50. Architects are required to submit plans, elevations, perspective, and a brief specification — practically a set of working drawings. The prizes are totally inadequate in view of the requirements, and would barely cover the cost of preliminary sketches. The Exhibition Association should be aware that the best architects will not enter a competition on such terms, and therefore any designs which they may receive will be the work of the less skilful designers. Had the first prize been in proportion to the other prizes, it would have amounted to \$1,000, which would have been a very modest sum. If new buildings are to be erected on the exhibition grounds—and few will deny that there is need for something better than the existing ones—the aim should be to put up structures of artistic appearance and perfectly adapted to the requirements. The individual buildings should not only be well designed, but the several buildings should be so arranged and designed that when constructed they will present a harmonious and pleasing effect. This result can only be accomplished by having some skilful architect lay out the general arrangement, and control, to some extent, the character of the designs. It will be remembered that this was the method pursued when the Chicago exhibition buildings were erected, and it was entirely justified by the result. It would be wise for the Association to place the designing of the smaller buildings in the hands of the architect whose design may be accepted for the main building, or if the various buildings are to be designed by different architects, then there should be consultation between them regarding the general arrangement of the buildings and the character of the designs. Unfortunately the competition has not been framed on proper lines, and it is hopeless to look for a satisfactory outcome. Even with the meagre prizes offered, a better result might have been secured if more time had been allowed the competitors. The one satisfactory feature of the competition is the fact that as the result of representations made by the president and members of the Ontario Association of Architects, it has been decided to have the plans which may be submitted judged by experts to be appointed by that body.

The Application of Color to Architecture.

THE subject of the application of color to architecture is one which has often times been discussed. An experiment in this direction is now to be made in connection with the buildings in course of construction for the proposed Pan-American Exhibition at Buffalo, New York. These buildings, like those at the Chicago and Paris exhibitions, will be constructed of steel and covered with staff. It has been decided to color the exterior of the

buildings. The work is to be done under the direction of Mr. C. Y. Turner, of New York, who is said to have worked out a color scheme which promises to give a satisfactory effect. The predominating colors will be ivory tints for the walls, with decorations in delicate shades of blue and green. All projecting features, such as domes and minarets, will be gilded. The buildings, which are strongly Spanish in design, are roofed with metal stamped to represent Spanish tiles, and painted a dull rich red. The effect of these metal roofs is all that could be desired, notwithstanding that the metal is extremely thin, and would not stand the action of the weather for a much longer time than the period over which the exhibition will extend. In order to secure the desired color effect, small models of the principal buildings have been prepared. These are placed on a platform, laid out to scale, representing the exhibition grounds. The wall spaces on these models are covered with strips of paper painted to the desired shade of color. We presume that the coloring matter will be applied, as at Chicago, by means of a spraying apparatus. The result of this experiment will be watched with interest by architects. It does not seem probable, however, that it will have any decided influence in encouraging the use of color to a greater extent than at present on buildings of a permanent character. Even in the favorable climate of Italy, color is not applied to the exterior of buildings, except in a few instances where colored mosaic is used. The application of color to a stone building, for example, would be entirely out of place, and would greatly detract from the dignity of the structure. This has even been the effect where stone of two or more shades of color has been employed in the construction of monumental buildings. In domestic architecture, however, color is being employed to a greater extent than formerly, and when judiciously used often adds to the beauty and interest of the building. Special training and care are, however, necessary on the part of the architect to secure this result.

ONTARIO ASSOCIATION OF ARCHITECTS.

Preparations for the annual meeting in January are in progress. Several interesting papers have been promised. The suggestion has been made that the meeting should be made coterminous with the Exhibition of architectural drawings by the Toronto Architectural Eighteen Club. An added inducement would thereby be offered to architects outside of Toronto to participate in the proceedings. The Association's new rooms, which by that date will be completely furnished, should also be a source of attraction to outside members. It is understood that an agreement has been reached between the association and the Toronto Architectural Eighteen Club, by which the latter organization will enter the Association as a body. This accession to its membership from the ranks of the younger men in the profession, should greatly benefit and strengthen the association.

QUESTIONS AND ANSWERS.

Would you kindly give us a price per yard for blasting and taking out of ordinary granite rock out of pit say 12 feet deep and 12 feet wide, also price for surface blasting.

Answer—We estimate that the cost of blasting and taking out granite rock from a pit 12 feet deep and 12 feet wide would run from \$3.50 to \$4 per yard, and the price for surface blasting from \$2.75 to \$3 per yard, according to the nature of the material.

A BRIEF HISTORY OF THE SCHOOL OF PRACTICAL SCIENCE.

THE banquet to be tendered on the 21st inst. to Professor Galbraith, principal of the School of Practical Science, Toronto, by the faculty, graduates, and undergraduates, has naturally carried the thoughts of many back to the early days of the school, as almost since its inception the name of Professor Galbraith has been regarded as synonymous with the success of the school. Established in a modest way to meet the demands for technical and scientific education, the growth of the institution has been almost phenomenal, until the increased accommodation provided from time to time is now entirely inadequate.

The present School of Practical Science is the successor of the College of Technology, an institution which was practically an evening technical school for artisans and others, and which occupied the building of the present public library, at Church and Adelaide streets. The origin of the present school dates from January 30, 1877, when the Legislative Assembly, in accordance with the recommendations of a report to the Hon. Adam Crooks, Minister of Education, by Professor James Loudon, sanctioned the proposal for the permanent establishment of a School of Science, and authorized the erection of a new building upon a site in proximity to the University of Toronto. The character of the institution was greatly changed, and under the new arrangement the chief object of the school became the teaching of engineering and applied chemistry. It was decided by an arrangement with the Council of University College, to utilize the teaching power of that college which already existed for the like objects in four departments and

could be made applicable to the wants of the School of Science, and in addition thereto to appoint a professor of engineering and such assistants as might be found necessary. This arrangement continued until the end of 1879, when the departments of science were transferred from University College to the University of Toronto, under the operation of the University Federation Act. That the students might continue to receive instruction in the above departments in the same manner, the School of Science was affiliated with the University of Toronto.

The building erected at that time forms the north wing of the present school. Besides being the home of the engineering classes, it furnished accommodation for the departments of biology, chemistry, and mineralogy of the University, the engineering department having but one floor.

The first calendar of the School of Practical Science is denoted as the session of 1878-79, and the faculty consisted of H. H. Croft, D.C.L., professor of chemistry; E. J. Chapman, Ph.D., L.L.D., professor of mineralogy and geology; James Loudon, M.A., professor of mathematics and natural philosophy; R.

Ramsay Wright, M.A., B.Sc., professor of biology; J. Galbraith, M.A., Assoc.Inst.C.E., professor of engineering; W. H. Ellis, M.A., M.B., assistant professor of chemistry. The attendance at the school in this year was six students.

From the calendar we notice that there were three courses, namely: (1) engineering; (2) assaying and mining geology; (3) analytical and applied chemistry. Regarding the engineering course, it is stated that in the absence of a machine shop visits to workshops and excursions during the long vacation will be taken advantage of.

An important event in the history of the school occurred on November 6th, 1889, when Professor Galbraith was appointed principal and the management of the school entrusted to a council composed of the principal as chairman and the professors, lecturers, and demonstrators appointed on the teaching faculty of the school. Recognizing the necessity of embracing every branch of applied science, the principal decided to extend the curriculum of the school so as to embrace five

regular departments of instruction, in each of which diplomas would be granted, namely, (1) civil engineering (including mining engineering); (2) mechanical engineering (including electrical engineering); (3) architecture; (4) analytical and applied chemistry; (5) assaying and mining geology.

In 1889-90 the management of the school was entrusted to a council of five, consisting of Professors Galbraith and Ellis, and Messrs. C. H. C. Wright, B.A. Sc., lecturer in architecture; T. R. Rosebrugh, M.A., demonstrator in engineering; and L. D. Stewart, O.L.S., D.T.S., lecturer in surveying, with Professor Galbraith as principal. These five are still members of the council, which has been enlarged

to include A. P. Coleman, M.A., P.L.D., professor of assaying and metallurgy; J. A. Duff, B.A., lecturer in applied mechanics; G. R. Mickle, B.A., lecturer in mining; R. W. Angus, B.A.Sc., lecturer in mechanical engineering; A. T. Laing, B.A.Sc., demonstrator in surveying; and J. W. Bain, B.A.Sc., demonstrator in analytical chemistry. In addition six Fellows have been appointed from among the late graduates.

As early as 1888 the necessity of providing increased accommodation was recognized by the Government, and an appropriation made for the erection of a large addition to the building. This addition was completed in 1891, the equipment and the laboratory plant installed being of the best then procurable. The building as now occupied represents a floor space of nearly 60,000 square feet, but, notwithstanding, the accommodation is overtaxed, and the work of the teachers made laborious by the necessity of repeating lectures and laboratory experiments three or four times in order that all students may receive the instruction. It has also been found necessary, from the same cause, to abandon certain experimental and research work.

That the School of Practical Science is meeting the



PROF. GALBRAITH,
Principal School of Practical Science, Toronto.

demands of the people is clearly demonstrated by the almost constant growth in attendance. The present year is the largest yet on record, the attendance being about 220.

It is interesting to learn that the graduates of the School of Practical Science are finding employment in connection with the development of the natural resources of the country, and that many of them are now occupying responsible positions. A glance at the calendar shows that of the 263 living graduates of the school, about 75 per cent. are employed in Canada, while the remaining 25 per cent. are scattered over other parts of the world.

PROFESSOR GALBRAITH.

The head of this admirable institution, Professor John Galbraith, is a son of the late Thomas Galbraith, of Port Hope, well known to every Scotchman in Canada as the Canadian agent of the "Scottish American." He was born in Montreal on September 5th, 1846, and educated at the Port Hope Grammar School and Toronto University. At the latter he took several scholarships in mathematics and general proficiency, and graduated in 1868 with the degree of B.A., securing the gold medal in mathematics and the Prince of Wales' prize for general proficiency. In 1875 he was granted the degree of M.A. He studied engineering under Mr. George A. Stewart, chief engineer of the Midland Railway, and was admitted as a Provincial Land Surveyor. He was employed for some ten years in railway construction work on the Intercolonial Railway, the Midland Railway, location of the Georgian Bay branch road, and exploratory surveys for the C.P.R. He was also employed for some time in the Portland Co.'s locomotive shops at Portland, Maine, U.S., and did consulting work in hydraulic engineering, receiving the appointment to the chair of engineering in the School of Science in the fall of 1878.

Professor Galbraith was one of the founders of the Canadian Society of Civil Engineers, serving for five years on the council of that body. He is also an associate member of the Institute of Civil Engineers of London, England.

As Principal of the School of Science, Professor Galbraith has labored zealously, and to him is due much of the credit for the high degree of efficiency which has been attained. At the outset he had an object in view. This was to fit the student for active professional work by giving him a thorough training in scientific principles rather than by attempting to give him a so-called practical training. It is along this line that the efforts of the school have been concentrated, and the wisdom of such a policy seems to be borne out by the results. If one were to enquire from any of the co-workers as to the secret of Professor Galbraith's success, the reply would probably be that it was due to his great qualifications in the direction of organizing the work at the school. As remarked by an intimate acquaintance, "he is a wonderful organizer."

After having completed his 21st year as head of the school, the proposed banquet to be tendered him is a fitting tribute of respect.

Geo. Bathy, of Wallace, N. S., is erecting a large brick factory in conjunction with his quarries. Formerly quite a depth of clay has had to be removed in order to reach the stone and this has been a serious drawback. The removal of this clay, which is fine material for brick manufacture, will result in stripping stone.

SOURCES OF ORNAMENTATION.

By FRED T. HODGSON, MEMBER O. A. A.

BEFORE proceeding with this essay, it may not be out of place to ask of ourselves, what is meant by ornament? Ornament, I should say is any design which may be added to any object with a view of making that object more beautiful or more interesting, but which would not be of special interest by itself. Ornament, then, is something introduced to give interest to an object other than it would possess without it. It is very important then, to bear in mind that the interest of ornament is, on this account, relative, and not absolute, because upon that consideration depends the truth of the views we may take regarding the proper adaptation of ornament. If we looked through the various classes of ornament, we should find that there were two divisions into which they are merged in regard to their application—that is, they were employed either to diversify or give interest to a surface otherwise uninteresting, or that they were applied to emphasize some part of the object ornamented—and especially to emphasize function and to draw attention to the most important part or parts of the object. The first named class might be distinguished as "surface ornament," the latter as "functional ornament," or ornaments raised above the surface, or in relief.

The poet Keats has beautifully told us, that "a thing of beauty is a joy forever," a trueism every intelligent being will accept without argument, but, we are compelled at this point, to propound another query, and ask "What is beauty?" A confessed difficulty lies at the very threshold of such an inquiry. We are at once confronted by an appeal to individual taste. A Chinese or even a Japanese will acknowledge no overpowering emotion in the presence of the noblest relics of Grecian antiquity—the Venus of Melos, the Cupid of the Vatican, or the Psyche of the Museo Barbonico. But he will rave about "golden lillies," or a mutilated doll, with slanting eyes and a pimple instead of a nose. Therefore, we may be told, the emotion, amounting in some instances almost to physical pain, that stirs the cultured individual on a sudden glance at the grandest relics of the Phidian age, is conventional. It is only the product of his education. The Venus of Milo is a bit of marble; and a huge bronze Kylin—an embodiment of all that man can pile together of the terrible—might stir the same emotion in us, if we had been differently trained from infancy. In arguments such as these there is enough of truth to constitute a respectable fallacy. In all phenomena that affect mankind we have to consider the external as well as the internal action. The objective, if it have any independent existence, cannot be conceived independently by the human mind. Subjective and objective are as inseparable as convex and concave or vice and virtue; the one is necessary to the other. If we speak of any phenomenal action, we have to imply the mode in which that action affects the human organization. Light is to us nothing but an abstract and most puzzling term, apart from our daily optical experience. Music is divine language to the person blessed with a musical ear; while it is an unknown tongue, or simply a noise, to a very large proportion of mankind which is destitute of that native faculty. And therefore, with regard to beauty, which we may regard as the visible expression of the highest excellence, any appreciation of its lustre must depend on the

mind in which the emotion is raised almost as much as in the object which raises the emotion. Beauty, then, is something that can not well be formulated, so as to meet the ideals of all people, though we may in a measure set up a standard—an elastic one—that will appeal to the emotions of an Aryan people, but, even then, we shall find tribes and local lines which mark a certain demarcation of taste. No doubt, on the other hand, there are principles which are of more universal application. The negro represents the devil as white; but, the negroes as a rule, admire the white man rather than the black or the dusky; even as the latter admires the white woman rather than the black. Homer clothed his immortals in robes of light, goodness and purity, and thus gave to them a beauty that reached beyond the confines of human imagination, or even of human worship, and so it is that the aspiring artist must ever hunger after a beauty that no chisel and no pencil can represent.

Nature is to be considered merely the germ of ornamental art; art must develop nature's suggestions, combine her forms and, besides pleasing the eye, subserve a purpose. Forms and colors seem in nature to excite admiration of a different kind from that involved by the productions of artists. The latter must please the eye, gratify the taste, and exhibit fitness for its special intention. The art of the past, that aggregation of experience derived from the application of the suggestive hints of nature is simply a means of study to the ornamentists, an aid to the mastery of principles and rules. The range and variety of illustrations to be found in nature represent every principle on which beauty depends; its study supplies a fertility of resource, even as regards construction, as well as the harmonious arrangement of parts, the ornamentation of those parts, and as to the degree of prominence which decoration should assume. But it is in decoration setting forth the special qualities of the artistic mind, confirming what is material to a designed purpose, expressing the perception and feeling of beauty and truth in the designer, that its great interest lies.

In designing the decorator has to take into account two kinds of expression, the one definite and certain, the other conventional and capricious, the former dependent on natural principles, the latter upon association. The force of association was illustrated when in France, archaic severity in ornament, at a period when republicanism had triumphed, was regarded as "the thing," and decorations assumed a funereal aspect. In projecting ornamental designs, as in realizing this effect, mental impressions have to be taken into account in artistic rendering. Thus, in form, angular expresses strength and durability; the curvilinear, softness, delicacy and fragility.

Definite forms may be classed as the rectilinear and rectangular, the rectilinear, but oblique angled, curvilinear forms without contrary flexures, curvilinear forms with geometrical contrary flexure, and curvilinear forms with contrary natural flexure. The discovery of the means by which the expression is given to them involves an extensive process of comparison. Often their conjunction and admixture have merely the significance that attaches to playfulness and delicacy.

The adoption of ornamental treatment suitable to a material has a decisive influence on design, as in gold in sheets—beaten, raised in lobes, fluted to give strength and shadow; in wire—as in coiled, spiral, and numberless curved forms. Stone has its natural expression

in masses, chambers, etc. This condition does not exclude one material taking designs proper to another. Foliage should perform no office other than ornamental, such as adding richness and variety, filling out forms and covering junctions, as in metal work. Hence the impropriety of using floral designs for brackets or bosses that are supposed to require strength and stability.

The Persians, in seeking to produce masses of brilliant and variegated color without offensive gaudiness, betook themselves to mosaics for the adornment of their walls and the exterior of their mosques, showing magnificent incrustations glistening in vitreous glaze. The radiant hues being natural, the colors and tints of real stone could not offend the sight; there was a certain sobriety even in the splendor of surface. Beautifully veined and naturally tinted woods have a charm independent of the design into which they enter, whilst the design, taking them into account, is also enhanced in its effects.

The character of material used for decorative purposes necessarily affects the essential features of the ornament. Lustrous, or dead surfaces, hues, or intrinsic qualities, are themselves constantly suggestive of new devices and effects. Mechanical operations and chemistry, brought to the preparation of materials, wonderfully augment the resources of the ornamentist. Both the art and science are illustrated in enamels, which, having for their base hard, resistive substances that are ground to an impalpable powder, and blended with cohesive elements, are rendered plastic and absorptive of color, finally being fired, so placing an essentially perishable colored design beyond the reach of change.

There are mysterious properties in colors that serve the purpose of the ornamentist, and suggest various departures in design that result in excellent effects without apparent rule. The eye, for instance, possesses the power to supply the complementary color of the hue on which it rests.

A celebrated French painter remarked that "every bed of violets was surrounded with a halo of purple." Again, whatever the laws that regulate color—and theories and deductions on this point differ—their aesthetic value or influence on the sentiments must be taken into account for satisfactory treatment.

A reed, a flower, a broken stem, what significance may not attach to them when elevated to decoration? as the reed in the flutings of Corinthian columns, the flower in moulded form or beaten metal as a symbol or emblem, like the lotus of Egypt, the broken stem setting off curvilinear lines in capital or in the mouldings of a cornice, a band or frieze on a vase, or on a panel in simulated carelessness of rendering?

To what are we to ascribe the simply perfect use of color by the Orientals? Whether they use the brightest or most subdued tones, it makes no difference, the patterns are harmonious and gratifying. They value the color only as it assists the purpose of design. As all pleasing effects obtained in decorative art are referable to the conjoined or separate expression of the laws of harmony and contrast, it would seem as though by some latent principle of mind, or passive reception of the subtle teachings of nature, they had unconsciously acquired their marvelous aptitude to treat color, not only appropriately, but so as to secure the best results. It is the same with their pottery, their enamels, their silk stuffs, and their tapestry and embroideries, executed with surprising manual rapidity,

and often without a formal pattern, and not merely in color. Whether by instinct or tradition they have marvelous appreciation of true form and proportion.

A man aided by a child constructs a gigantic jar as we build a house with no other instrument than the hands and a spatula; an amphora of extreme height, and presenting beautiful corners, is produced. On the borders of the Nile females with their children make alkarazas so eloquent in form as not to need the aid of color to command admiration. With orientals the sense of the beautiful shows itself in all things.

Flat ornament is the most natural and obvious means of decorating solid surfaces, and this in conventional form. The source of this appropriateness is to be found to reside, so to speak, in the moulding or carvings of natural forms as something simply imitative, and, therefore, with all the labor and ingenuity exercised of no high order of art, and therefore not conforming to an imposing position.

In many branches of art the designs are drawn direct from nature. The designers of textile fabrics may be seen with a group of flowers freshly gathered from a garden in small vases before them arranged so as to present some novel or pleasing effects which are transferred in modified form to their patterns. The same colors or precisely the same forms may not be reproduced, but the flowers and the portion of the group dealt with are artistically wrought out.

Sometimes the flowers that serve as models for decorative metal work are pressed between boards so as to present an aspect to some extent conventionalized for treatment in his bas relief. This method of securing the original of patterns has for ages been adopted in the east, and serves to account for some of the really exquisite transformations that we witness.

Many forms of the ornamental class are not naturally supplied. Such is the Greek fret series of squares, one within another, interior lines being brought up at intervals, thus getting rid of the mere square. Arabic decoration, though very ornamental at first sight, was in reality based on extremely simple combinations. Celtic art with its mystic interwoven strap-work and grotesque monsters is chiefly formed of the higher geometrical curves and right lines, and is perhaps, the most difficult to analyze. Natural forms unless distorted, are seldom introduced in Celtic art.

It is a curious fact, that some of the choicest patterns of apparently eastern origin, of the eastern carpets, have been reproduced from the paintings of old Flemish masters—Van Eyck—Memling, and others, and the Florentine artists, such as Shirlandage and Montegna. So also with hangings, table covers and other similar products. Some of these painters simply give divisions of color and main outline of the patterns, and in place of angles substitute curves; others, like Holbein, delineate even the very stitches.

In a design of varied character the desirability of introducing a few points of resemblance between the forms, thus establishing certain affinities, provides a contribution to decoration. The securing appropriateness in the ornamentation is another requirement that has its influence in fashioning ornament. The ox heads and festooned garlands carved on the friezes of Roman temples had a practical value as betokening sacrifice, whilst in other public buildings they would have been stupid and vulgar.

Consonance or agreement with the general design is a prime element of good ornament, and it is just be-

cause this consonance is not found in ornamentation of a different purpose that the ornamentist finds so much in bygone art that cannot be utilized. The introduction of an opposing tone in colors to impart unity of effect, is a leading element in color design. The upholsterer who brings together two colors—say yellow curtains with green covered chairs—will wisely repeat the green in the curtain in a narrow strip, to harmonize with the chairs. Contrast usually involving alternation, some of the most beautiful effects of form are obtained through their connection. To the contrast of form and color decoration owes some of its happiest inspirations. A further source of beauty in ornament is derived from the prevalence of one quality in color, or of a given size of form over another.

It is noticeable that all that is lovely in landscape is produced by contrast of tone, not color—by the bright green of young shoots against the dark, sombre green of the older wood; by the gay birch with its bright leaves against the dark green pine, cedar or hemlock, and these against the deep blue sky as a background. The present advance of decorative art is largely due to more attention being paid to contrasts, and to their more skilful manipulation.

The circumstance that the mind never draws the line too close between use and ornament, has led to articles of vertu in the precious metals to the blending of both in structural forms, and with little conventionalism as regards ornament. An instance occurs to me in a silver standard consisting of a stalk with the leaves of a honeysuckle gently folded around the stalk at irregular intervals, and a flower here and there showing itself between the leaves. The richness of the material justified the labor and ingenuity expended upon it. Similarly, on vases of precious metals, nature, leaves, foliage, flowers and stems may be imitated as closely as one pleases in relief, or as undercut work, if only care be taken that it shall fill up a defined and bordered space.

In the Arabesque style of foliage and tracery there is a mild freedom which pleases the fancy, partly because no actual natural forms are portrayed, whilst yet they are suggested in the flowing outlines, in the lightness with which the ground is touched, and yet transformed in effect and the way in which the sight is lured to traverse over the whole surface. But as a means of decoration, Arabesque is to be used charily; it has indeed the charm of repetition, but where uniformity is equal the beauty of forms is in proportion to their variety. The harmony established is by analogy of size, color and form, but affinities may be carried too far. The true law of harmony is conformation and divergence.

The collected experience of artisans of the past constitutes a leading source of ornament. Carvings and mosaics, figured tissues, stained glass, metal work, even paintings and architectural treatment of decoration supply a fund of artistic instruction, not for reproduction, but suggestive of new combinations.

The course of ornament, renewing at intervals of time features of previous periods, with new characteristics super-added, has its counterpart in seeds transplanted to new soils and climes, the change resulting in new developments that in some respects are wholly new. Thus, the growth of new features in the art of ornamentation is continuous and everlasting. One new design suggests another, and the chain lengthens and broadens as time advances, each race of mankind following that style of ornamentation that seems most suited to the peculiar qualities of its mental structure; indeed, it has been hinted that a man's liking for this or that style of ornament may be taken as an evidence that he descended from the Aryan, Semitic, Turanian or Celtic stock, according to the style he admires most.

STUDENTS' DEPARTMENT.

C. A. & B. STUDENTS' COMPETITIONS.

The publishers of the CANADIAN ARCHITECT AND BUILDER invite architectural students and draughtsmen resident in Canada to submit drawings in the following competitions:

STUDENTS' COMPETITION FOR A PORCH.

A plan, section and perspective sketch are required. Explanatory detail sketches of certain portions may also be included.

The subject is an entrance porch to a city house of 35 feet frontage facing south or east on a 50 ft. lot. The porch to be large enough for use as a verandah, and yet not to cover all the front windows, as it is desirable to have the sunshine enter the parlor by at least one window.

The porch may be of wood, brick or stone or combinations thereof and may have flat or sloping roof.

STUDENTS' COMPETITION FOR ENTRANCE DOOR, VESTIBULE AND VESTIBULE DOOR.

A plan, and section are required and elevations of both doors.

Explanatory detail sketches of certain portions may also be included.

The subject is the entrance from the above mentioned porch. Light may be obtained for the vestibule from a window on one of the walls not occupied by the doors, or from the entrance door or wall in which the door is placed.

The vestibule must be large enough to accommodate a fair sized hat rack and an umbrella stand.

Drawings must be made with pen and perfectly black ink on white drawing paper or cardboard. No brush or color work will be allowed. Drawings should be so arranged as to admit of photographic reproduction in the illustration pages of the CANADIAN ARCHITECT AND BUILDER. The size of each page is 7x10 inches. No set of drawings must occupy more than two pages.

Competitors must send in their drawings, prepaid, under motto marked "Students' Competition," and addressed to "the publishers of the CANADIAN ARCHITECT AND BUILDER, Confederation Life Building, Toronto," prior to 5 o'clock p.m. of the dates set for the competition, viz; 1st competition, Thursday, 27th December, 1900; 2nd competition, Monday, January 28th, 1901. Each set of drawings must be accompanied by a sealed envelope bearing on the outside the author's motto and enclosing a card giving his full name and address.

The merits of the designs which may be submitted in these competitions will be judged by a committee of the Ontario Association of Architects, whose decision shall be final. For the benefit of competitors, the judges will be requested to give a detailed criticism of each design.

Three prizes are offered in each competition as follows: To the winner of 1st position, \$10; to the winner of 2nd position, \$5; and to the winner of 3rd position, one year's subscription to the CANADIAN ARCHITECT AND BUILDER.

The right is reserved to publish any or all of the drawings.

NOTE—Competitors are required strictly to observe and comply with the above instructions and conditions.

TORONTO ARCHITECTURAL EIGHTEEN CLUB COMPETITION IN RENDERING FROM PHOTOGRAPH FOR STUDENTS.

The students must render in pen and ink only and to twice the size of cut.

The subject will be accompanying cut on Eighteen Club page of chapel in St. James cemetery, Toronto.

The paper to be white and to be 15" x 22"

The drawings will be judged by the members of the Eighteen Club.

There will two prizes, one of ten dollars for the best drawing submitted by students who have served for a period not exceeding five years, and one of five dollars for the best drawing submitted by students who have served for a period not exceeding three years to date of issue of December number of CANADIAN ARCHITECT AND BUILDER.

The drawings must be signed by author's name and must be accompanied by a letter stating length of service and signed by one of the firm in whose office the pupil is serving.

The best drawings in each class will be hung in the Eighteen Club's exhibition from Jan. 26th to Feb. 9th, 1901; and the best drawing submitted will be reproduced in illustrated catalogue and both prize and honorable mention drawings will be published in the CANADIAN ARCHITECT AND BUILDER.

Every competitor will receive a copy of the Toronto Architectural Eighteen Club's illustrated catalogue free.

Drawings must be delivered to or mailed so that they will reach Chas. D. Lennox, 71 Yonge street, Toronto, not later than noon on Saturday, Jan. 5th, 1901.

TORONTO GUILD OF CIVIC ART.

At the annual meeting held last week the following officers were elected:—President, E. F. B. Johnston, Q. C.; vice-presidents, Hon. Geo. W. Allan and A. J. Somerville; treasurer, James Bain, Jun.; secretary, A. H. Campbell. The following were appointed members of the Advisory Board:—Messrs. G. A. Reid, F. S. Challener, Allan Cassels, B. McEvoy, G. N. Morang and G. A. Howell.

By request of the Minister of Education a committee was appointed by the Guild early in the year to select the paintings annually purchased by the Provincial Government for the Normal school gallery.

The Municipal Committee of the Guild submitted to the Property Committee of the City Council a comprehensive plan of mural decoration for the City Hall and asked for a preliminary appropriation of \$1,000 with which to begin the work. The Property Committee approved of the plan and of the work being done under the supervision of the Guild, but on the plea of lack of funds, the granting of an appropriation was deferred.

The Guild are trying to induce the Committee which has in hand the erection of the proposed Simcoe memorial to invite sculptors to submit designs in competition.

ILLUSTRATIONS.

GOLF CLUB HOUSE, TORONTO.—CHADWICK & BECKETT, ARCHITECTS.

RESIDENCE OF MR. BEAUMONT JARVIS, ROSEDALE, TORONTO.—BEAUMONT JARVIS, ARCHITECT.

M'DONALD ENGINEERING BUILDING, M'GILL UNIVERSITY, MONTREAL.—ANDREW T. TAYLOR, F.R.I.B.A., ARCHITECT.

CHAPEL IN ST. JAMES'S CEMETERY, TORONTO—SUBJECT FOR RENDERING IN TORONTO ARCHITECTURAL EIGHTEEN CLUB'S STUDENTS' COMPETITION.

ILLUSTRATIONS ACCOMPANYING PROFESSOR SQUAIR'S LECTURE ON "CHURCH ARCHITECTURE IN NORTHERN FRANCE."

COLLEGE RESIDENCE AT SACKVILLE, N.B.

THE accompanying plate illustrates the handsome brown stone residence recently completed in Sackville, N.B., in connection with the college there. The main building is four stories, size 217 x 50 feet, with a rear ell, 90 x 45 feet, and was designed by Messrs. Burke & Horwood, of Toronto. It replaces the residence which was burned last year.

The students' rooms are bright, airy and commodious, and present alternating systems of rooms in pairs (study and bedroom for two), with apartments for single occupancy. The large hall in the ell is a handsome room having an open truss roof with exposed timbers, and ornamented windows.

The building contains spacious and sunny dining room, well lighted reading rooms, large office and re-

1900, may be admitted without passing the examinations prescribed for students, if the Council after taking such steps as may be necessary to satisfy themselves of the qualifications of applicants, are agreed as to their fitness."

This resolution was published in this journal in August and some desirable men have been added to the roll of membership, and it is the desire of the Council that further applications shall be made immediately as the opportunity ceases this month. Application should be made by sending name to the registrar, W. R. Gregg, 94 King street west, Toronto, who will bring it before the Council.

SWEDISH BRICKWORK.

SWEDEN is a country of forests, and until recently, says the British Clayworker, the domestic buildings



COLLEGE RESIDENCE AT SACKVILLE, N. B.—BURKE & HORWOOD, ARCHITECTS.

ception rooms, Y. M. C. A. rooms and rooms set apart for hospital uses.

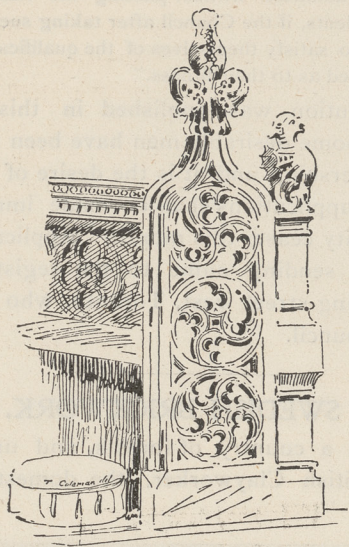
A large reservoir in one of the towers provides protection from fire. Drainage, plumbing and ventilation appear to have received particular attention.

MEMBERSHIP IN THE O. A. A.

THE attention of the architects of Ontario who are not members of the Ontario Association of Architects is called to the fact that as was proposed at the last annual meeting a special arrangement was made to admit members during the year by passing the following resolution:

"Whereas the Association is endeavoring, during the current year, to establish conditions of new activity and usefulness, and certain architects are in consequence desirous of becoming members of the Association without passing the examinations prescribed for students, be it therefore resolved that: Architects who have not registered, nor passed the examinations prescribed by the Association, but who otherwise satisfy the requirements of the "Ontario Architects' Act," and who apply before December 31st,

were constructed almost entirely of wood. Time after time, however, the towns have been laid waste by fire, and from the ashes there are now rising towns of brick and stucco. The bricks are usually larger than those employed in this country, measuring about 12 in. by 6 in. by 3 in., but the size varies in different districts. For exposed brickwork, header bond is generally adopted, the angles being formed with three-quarter bricks laid alternately along each return. At Upsala Cathedral, however—which, by the way, has been restored till it looks as if it were built yesterday instead of five hundred years ago—the bond is somewhat curious, and varies in different parts of the building. Most of it is a modification of the so-called Flemish bond, and consists of two stretchers followed by a header. The effect is far from displeasing. A few modern buildings in Stockholm are faced with rock-faced wall stones, shading in color from yellowish-brown to purple. The courses vary in depth and in width of bed, so as to bond with the brickwork behind.



BRITISH COLUMBIA LETTERS.

No. IV.

PROBABLY the most important event that has yet taken place in the provincial world of art is the first annual exhibition of the Arts and Crafts Association which was held in Vancouver at the Alhambra Hall on 24th, 25th and 26th of Sept. In the absence of the association's patron, His Excellency the Governor General, the exhibition was declared open to the public by the Mayor. Several hundred visitors were admitted during the period mentioned. Somewhat more than three hundred exhibits were catalogued, and of this number far too great a proportion belonged to pictorial art; architecture, design, furniture, carving and so forth were all too thinly represented, but some exceptionally good collections of photographs, several good examples of pyrography, of stained and painted glass and embroidery and some really excellent painted china invested the crafts section with considerable interest.

Dealing with the subjects in catalogue order: the first screen was devoted to the work in oils of Mrs. Marcus Lucas whose clever sketches in the impressionist school deserved much of the favorable comment made on them; a small low-toned picture of Botany Bay, N. S. W., and a delightfully hazy morning in Burrards Inlet being perhaps the best of this member's exhibits. W. M. Forrest's amazing industry is proved by a vast amount of work. We think he would do himself greater justice if he devoted his capacity for downright hard labor to a more sympathetic treatment than to such prolific production in a somewhat stereotyped manner; his technique is too hurried and there is frequently a photographic effect noticeable; the color and motion of water is happily caught in several sketches. W. Ferris, who is another great worker, contributed many pretty subjects, nearly always well chosen, but not so frequently pleasing in color, which is too dense, particularly in the forest shades. Mrs. Waterfall's study of still life was in many respects excellent and we shall expect to see a marked all round improvement in this lady's work; the other exhibits in oil were mostly very amateurish, and in too many instances were merely copies of no great promise.

Of the water colors, it was generally conceded that Mr. T. W. Fripp's drawings simply stood alone, being the only work which may be said to be really representative of the genuine old school of water color painting and following the traditions of this truly English art; in some of W. Fripp's warm, broad, sunny effects,

notably in a charming little sketch of Southwold, and near Streathy, on the Thames (England), one recognizes the influence of a great master who for nearly half a century was closely connected with the water color society.

Mr. Mower Martin, R.C.A., was well represented by nearly a dozen sketches and drawings, executed with much vigor; the rather hard contrasts offered by the white, snow-topped mountains and the black green timber is scarcely true to nature, for there is always a haze, a mist, an atmospheric softening, as it were, even at sunset when the contrasts are most markedly hard; that Mr. Martin does find this softening effect is proved by some of his work, deep and rich in tone and color and certainly not lacking atmosphere; a little bit of wet cloudy April sky with patches of wet soft blue breaking through is a charming piece of sky, rock and tree; and a brilliant and luminous sketch of a siwash canoe silhouetted against a western sky out of which the sun has disappeared is admirable. Mr. Ferris' screen of water colors is chiefly made up of sketches in and around Vancouver, many pretty bits of sky and water, but we would suggest that he subordinate his foregrounds far more than he does at times, and that if he stippled less and washed or stained more he would gain both in breadth and transparency. This same lack of transparency is apparent in nearly every exhibitor's work. Water color should not be applied as an opaque, and the use of body color is entirely contrary to the traditions of the art and its best traditions; if it is desired to work in opaque mediums, why not adopt oils, pastels, tempora and so forth? The greatest beauty of water color is in its transcendental transparency of effect, which is never obtained in any other medium—the use of body color with water color is to acknowledge the want of ability to work in a legitimate manner.

Among the other exhibits in this class Miss McClung's "Fruit and Flowers" and Mrs. M. Garney's work in the same direction must be accounted much superior to the rest. Why does not the first named artist turn her attention to decorative painting, to which fruit and flower subjects are so peculiarly adaptable? A portrait study of a head by Miss Marstrandt was far and away the best black and white exhibited. The color of the neck cloth too closely approaches the tan of the flesh and mars to some extent the moulding of the chin; we should have referred to this lady's sketch in oils of a Chinese servant which shows considerable decision in treatment. Miss Marstrandt's second sketch in oils, a bit of a Lulet we think, is crude in color and harsh in treatment.

A capital piece of carving (W. F. Coulfield), of a chain of Dolphins leaping through a broken and following sea is boldly carved in English oak. A table with an inlaid top (W. Campbell), shows much technical skill and is certainly a handsome piece of work rather crudely designed, the legs being quite trivial and overlaid with meaningless detail, but the workmanship throughout is first rate. A good type of quaint old Somersetshire table, known as a "court table," made in cedar by W. Bowman from a detail by the President, was almost the only other exhibit in furniture. A fire screen designed by W. J. Bloomfield and executed in wood and leather with pyrographic decoration by Mrs. Ellis is admirable; the drawing the chief's head on the leather hanging is not quite in keeping with conventional treatment of the wood frame; the drawing of the head should have been

in the crude form characteristic of the genuine Indian drawing. Miss McClung's display of pyrography included a fine cedar chest and a number of smaller trifles in which were displayed taste and ingenuity.

Messrs. Henry Bloomfield & Sons had a fine exhibit of leaded glass and painted glass in which native flora appear frequently as the decorative motif, a step quite in the right direction. Some of the work, all of which is designed and executed entirely by members of the firm, was genuine leaded glass, that is to say, it was wholly dependent upon the utilizing of the lead lines for its drawing and to stained glass for its color, in contradistinction to painted glass, which is a picture painted upon a transparent ground.

In embroidery Mrs. Balfour Ker fully maintained her reputation. We regret to hear that Mrs. Balfour Ker intends to devote herself entirely to painting in the future. We trust this intention will not be adhered to as this lady's skill in the applied art quite exceeds her success as a pictorial artist.

When it is considered that the number of architects practising in British Columbia probably is nearly half a hundred it is surprising to find but three of that number exhibiting on the walls of the association. The disregard, not to say ignorant neglect, of the art of architecture by the public is not at all surprising. If the practice of the first and highest of the arts lie with men who are themselves so little appreciative of the real position of architecture in the world of art, or so little desirous of impressing upon the public the high nature of their vocation, what can be expected from that same public but a continued attitude of indifference? In this province an architect is so seldom believed to be an artist that if one does happen to dabble, say in water color sketching in a slight and amateurish manner, folks agree that "he is quite artistic" as though it were possible for a man to be worthy of the name of architect without being an artist, and as though there were so little scope for the exercise of artistic taste and knowledge in the vast field of unlimited opportunity to be found in decorative composition alone that the quite artistic one should be compelled to turn to trifling with pictorial art to there find scope for his artistic aspirations, restrained and cramped as they must be by the narrow limits of architecture! This is, no doubt, somewhat of a digression, but, really, an Arts and Crafts Association with scarcely a sign of the architectonic foundation upon which such associations must of necessity rest is a noteworthy curiosity. Beyond a sketch of the C.P.R. station at Vancouver by W. J. S. Parr and a neat pencil drawing of an everyday "alteration and addition" by W. Eveleigh, the only architectural drawings are by the President, whose large brown ink perspective of the Provincial Home at Kamloops was illustrated some four years ago in this magazine, as was also a design for a church in New Zealand. Among others we noticed a "rejected address" in the form of a design for a public school which was probably quite beyond the understanding of the school trustees, sketches for furniture, mantels, a chancel screen, all fully illustrated by details, and strongly drawn in brown ink and sepia after the president's characteristic method.

Mrs. Taylor exhibited a collection of photographs showing artistic perception in pose; all were soft in tone yet rather lacking in detail, probably the result of incorrect focussing of the subject to obtain the pleasing

"so like a black and white, you know" effect. Messrs. Wadds Bros. also had an interesting show of photographs, one of which, a little child's head, is unaffectedly pretty and noticeably true as a photograph. But the photograph par excellence of the exhibition is a Rembrandtesque head by W. Eveleigh. Here we find all the extraordinary detail and sharpness of genuine photography, coupled with excellent pose and light, and beautiful printing. Two very large bromide enlargements by Miss Edwards must have been made from a remarkable negative, there being scarcely a defect in the enlargements.

Though mention is made last of the painted china shown by various members of the association, it must be frankly admitted that it was one of the decided successes of the exhibition. Miss Cohen, of Toronto, was represented by several pieces of decorated ware, beautifully painted and rich in tone. Among the pieces by Mrs. R. B. Ellis, a charming little jewel box and a fine punch bowl deserve more than passing attention, though all of this member's work is good. Miss McClung had some excellent work on the same tables, a pair of plaques being particularly nice in color. Miss Drainie also contributed an interesting collection of examples of her skill and taste. Upon the whole, the china, as stated, was really good, showing clear painting and burning, but the natural forms so well reproduced were not always as decorative in their application and composition as they should be, and the conventional form was scarcely used — Mrs. Ellis' jewel box, decorated with a form of Persian arabesque, being the noticeable successful exception. No doubt difficulties present themselves when the decorative motif is a conventional treatment of a natural form, that do not appear where the natural form is merely copied more or less faithfully, and is really only a little picture of fruit or flowers painted on china, but the triumph of success is altogether disproportionately greater when the conventional treatment is happily brought about.

The association owes a large measure of the success of this, its first annual exhibition, to the energy of its zealous young secretary, W. C. Bloomfield; indeed, all the officers have worked earnestly to place the association upon a firm footing, and the promising nature of the exhibition just recorded, should encourage them to persevere in their good work. We had almost forgotten to make mention of the school competitions, open to children of various ages, not exceeding 16. Some 60 entries were adjudicated upon, some of them showing quite a little originality and care. It is to be hoped that the trustees of the public schools will in their turn do something to encourage and to develop a little artistic feeling and knowledge among the rising generations.

The building operations of the year must be considered in another letter, but mention must be made of a competition instituted by the C.P.R. for alterations and additions to the company's hotel at Vancouver. It appears that the building is to be almost entirely rebuilt, and several of the local architects have been invited to submit plans in the competition. The instructions (sic) are embodied in a chat with the manager, and competitors are expected to make their own surveys of the existing structure, a task of no small magnitude, if it is seriously intended to utilize it (the existing structure) to any considerable extent. It seems pre-

posterous that a large corporation like the C.P.R. should be too, shall we politely say, economical, to provide a few blue prints of the plans of the hotel as it now stands. If the competition is seriously meant it should be seriously constituted, with proper instructions drawn up with the assistance of a qualified assessor, to whom the designs should be submitted for criticism and comparison. Competitions have fallen to so low an ebb that it is well nigh hopeless for any one not having a "pull" to enter with any chance of success on merits; indeed, architects submit to "conditions" under which no self respecting association of builders would consent to furnish a single tender, and the architects have only themselves to blame if the building public accepts them at their own valuation.

THE PRACTICAL EDUCATION OF THE ARCHITECT.*

BY FREDERICK BATCHELOR, F.R.I.B.A.

The advantages of general education and culture are called in question only by those who are wanting in them, but their influence on professional success is not perhaps so universally or so fully appreciated as one could wish.

The advantages of a general education to an architect are intensified by two things: namely, the more technical character that is gradually being given to it, and the catholicity of an architect's profession.

Wherever civilized man is found be he "Christian, Jew, Turk, Infidel or Heretick," he loves to make his homes, institutions, palaces and temples, not only cunning in contrivance, but each in its own way a little world of his aims and aspirations, a very Walhalla of all that is precious in art past and present, and to have impressed on each, and by a master hand, those individual, tribal and national characteristics which find more lasting if less vivid expression in architecture than the other fine arts. The designer has simultaneously to contrive, adorn and to find material expression in his work for the innermost habits and needs of every kind of client. The past may perhaps be peerless in monumental art, but I venture to think that nowhere has the range of a designer's sympathy had to be more catholic and encyclopædic than in the beautiful and loving domestic work which has marked this half-century's renaissance of architecture and its allied arts and crafts. When the tendency to the introduction of hand-and-eye training into most schemes of general education since the principles of Froebel and Sloyd have been abroad is considered, it will be abundantly evident that not only has the architect's need for general education and culture advanced, but that the theory of the latter has developed on lines perhaps more akin to the calling of the architect than any other, except those of the sculptor and painter.

There can be no doubt that a sound course of general education must precede any special departure, but how soon that departure is to be introduced into the home, school or university is a misleading question. It assumes that there is but one answer, whereas there are as many answers as there are characters and callings. The Association has already done much, but I propose, with your help to organize in the coming session a regular series of technical demonstrations, both at works in progress and also in the workshop. A pupil may know the four volumes of Rivington's "Building Construction" by heart, and have visited all the works on which the staff in his office are engaged, and yet be unfit to supervise, for three reasons: Firstly, that every class of work does not necessarily find a place in the practice of even a very busy architect during the pupil's quinquennium; secondly, that a set of contractors has occasionally been known to do such good work as to deprive the pupils of their legitimate experience through rejection; and, thirdly, that visits to workshops and manufactories are quite as important as those to works in progress. I propose to meet the first want by arrangements such as have already been made with various architects and, occasionally, engineers to visit works in progress under their supervision. I do not anticipate insuperable difficulty in meeting the second want, but what we have yet to provide is a systematic series of demonstrations of good and bad materials and workmanship, and the means of distinguishing and appraising them, at sight and by applied test, taken, say, in the usual order of a specification. To

meet the third want I look for the co-operation of the master-craftsmen, merchants and manufacturers in the neighbourhood of Dublin.

The timber trades alone will entail several pilgrimages. I question whether the most didactic among us would care to speak ex cathedra on the article itself. The stereotyped specification founded on the relations at one time rife between qualities, uses, ports of shipment, and market forms and marks is out of date, and the dearth of the dry red deals which stocked Dublin sheds in the good old days has not only introduced a new cult—that of the American baulk—but largely increased the demand for second Quebecs; whilst departures such as Kauri, and Oregon pines, sequoia, canary, maple, and cypress are courting attention and making new demands on technical demonstration. From the timber yards we might perhaps turn to the creosoting works, and fill a few pages with notes on the process, the pounds per cubic foot injected for various uses, the pressures applied, and the depths of penetration. A visit like this, where we could handle the stuff, compare a few sawn sections, and pump the showman for all we were worth, would teach us more than a dozen text-book descriptions. After such a pleasant diversion our attention should be ripe for the saw mills and the carpentry and joinery shops.

The variety of sawn scantling now imported, especially from the Baltic, renders the appreciation of market forms in the importer's yard less problematical than when it was more confined to the log and the baulk, but it is in the saw mill perhaps that we have most to learn from technical demonstration. I imagine that one of the chief advantages of technical demonstration in the joinery shops to a Science and Art "pass" man would be the dispelling of his little illusions in regard to the present use of framed floors and tongued and grooved back-linings in cased frames. What a shock to discover that the girder and the binder have been ousted by the steel section, that the insinuating steel nail makes a better edged-joint than the time-honored tongue; that the tenacious tusk-tenon, the darling of his prettily-shaded isometrical details, is practically confined to trimming; and that so great a man as Viollet-le-Duc would drive it even from that refuge. What is even more wanted, because of its comparative neglect in this branch of technical education, is a similar demonstration in the shop-fitting and cabinet-making crafts; crafts whose niceties are only worked out by the specialist who can get a fair price and escape the demoralisation of the cut-throat competition now being fostered by government departments. I would conclude the series by an examination of some of the best examples of genuine old joinery and fittings in the last-century houses of Dublin, such as still linger in Henrietta Street, Rutland Square, Sackville Street, Kildare Street, or Ely Place; and of the old furniture in the Science and Art Museum, much of which might be measured and drawn with advantage. Few technical studies are so refining in their influence upon the design of architectural joinery as that of the good old furniture of the sixteenth, seventeenth, and eighteenth centuries, and there can be little doubt that the coarseness of the Gothic revival was largely due to its neglect. Another series of demonstrations which would very materially increase our stock of practical knowledge may possibly be arranged in connection with stonemason's work. In these yards the various building stones in common use for constructional purposes, and also those employed in decoration and in sculpture, could be exhibited, and I hope, a number of valuable hints obtained from the master-mason's ripe experience as to what quarries have produced the stones best able to resist the disintegrating effects of our Irish climate. We would expect, too, that the flaws and defects peculiar to each description of stone would be pointed out. The methods of setting out the work and the subsequent operations of sawing, dressing, carving and polishing the stones would be demonstrated. Then again we have in Dublin quite exceptional opportunities for seeing in well-equipped workshops art metal work, constructional steelwork and foundry work in all stages of production. I venture to think that if the young architect would avail himself of the opportunities now held out to him to increase his stock of practical knowledge, that knowledge would react most beneficially, not only on the morality of the master smith, but on the pocket of his clients. He would no longer create designs, presumably for wrought-iron, which could be produced only at excessive cost in that material, or else in the form of a malleable casting which might deceive both architect and client alike.

In the details of plumber's work the average architectural student or assistant is lamentably ignorant. He is probably

* From inaugural address delivered before the Architectural Association of Ireland, on October 9th, 1900.

acquainted with the first principles of sanitary plumbing; he will not, for example, leave a soil-pipe without ventilation; he will arrange for the disconnection of the house drain from the sewer, and he may even provide for a proper current of air through the drains; but when questions are put to him by the ingenious plumber concerning the laying-out of the hot-water circulating pipes or the connection of the w. c. trap with the soil-pipe, he is liable to be placed in a position not entirely compatible with the dignity of the "arkos tectone."

From plumbing work it is not a far cry, in Dublin at all events, to enter the establishments of the master painters, for in more than one instance these trades, curiously enough, are combined.

Pilgrimages of similar scope, to the haunts of all the crafts that an architect calls to his aid, in ecclesiastical, civil, or domestic work, are in contemplation.

I have tried to put before you the paramount need of general education, of improved opportunities in the technical training which is our special stock-in-trade, and of the culture which refines their use and combines them to their best ends. Without a full measure of these things ambition is heavily handicapped. I speak, of course, of ambition in its broadest sense, the ambition to deserve and fill a niche in the Temple of Fame, not the mere instinct of self-preservation and successful plunder which we share with the domestic animal or the beast of prey; the desire to swell the store of wisdom already laid up in technical achievement and record, to raise and maintain the status of our calling, to extend without fear or favour the benefits of our ripe experience, to bear with and live down the prejudices or jealousies of our clients or fellows, and to feel ourselves efficient factors in private, social and national life—citizens, in fact, of no mean city.

I have not spoken of personal gifts, but without a fair heritage of aptitude, fostered in the hope of something better than by-ends, the seed may fall on barren soil. If we cannot choose we can at least cherish them, so that when our barns and armouries are fuller than those of the less gifted or thrifty, we can draw upon ripened grain, or take down a burnished weapon from the rack.

CHURCH ARCHITECTURE IN NORTHERN FRANCE.*

By PROFESSOR J. SQUAIR.

The subject of architecture is one possessing many aspects. We may, for instance, regard buildings from a mathematical or æsthetical standpoint, or we may consider them as successful adaptations of refractory materials to the purposes of utility or beauty, or we may consider them as reflecting the ideas and tendencies which characterize the age to which they belong. The latter is the one to which we shall confine our attention at present.

The art of France in the Middle Ages is one of great richness and variety. All the forms of literature flourished: epic poetry, lyric poetry, the drama and the chronicle. Sculpture was carried to a high state of excellence. But the architecture of the period is the richest form of artistic legacy bequeathed to modern times. An attempt has been made in the nineteenth century to revive an interest in mediæval literature and many beautiful things have been brought to our notice which were overlooked by the men of the seventeenth and eighteenth centuries. Scholars and critics have republished and expounded and sometimes modernized the great epics and dramas of the Middle Ages, but it is doubtful whether any permanent vogue regarding these works will ever be re-established. Some of great patriotic value such as the *Chanson de Roland*, or some of the beautiful lyrics appeal strongly to men of our time and will not be forgotten, but the number of ancient poems secured from oblivion will be small. Quite otherwise is it with architecture. Here, all the samples of mediæval art which remain are regarded with the greatest favor. The contempt which was heaped upon them by men of classical tastes has been forgotten and they have become models for the architects of to-day.

Church architecture in France in the Middle Ages is represented by two great types, the Romanesque and the Gothic. Notre-Dame de Poitiers, of the end of the eleventh century, is a sample of the Romanesque style. It is an oblong building of a type developed from the Roman basilica. Its nave and transept form a cross, its arches are round, its walls are low, and the flying buttresses are absent. From the Romanesque style was developed the Gothic. The same cruciform ground-plan is at the basis of both, but the Gothic takes an enormous flight upward. The nave becomes very high, to support which the flying-buttresses so characteristic of the Gothic style are developed. The façade un-

dergoes marked changes, the great towers become a striking feature. Beautiful details like the rose-window and the delicate arcades are invented. The pointed arch gives also opportunities for richer sculptural displays. In the Gothic church mediæval architecture reached its climax. The great cathedrals of Paris, Reims, Amiens, Chartres, etc., have never been surpassed by other buildings in point of beauty. The thirteenth century is the period of highest excellence, but the style was continued for a century or two later.

In the fifteenth and sixteenth centuries the new movements to which the name of the Renaissance is given led men to consider more closely the art of Grecian and Roman antiquity. The result in architecture was that they began to show contempt for Gothic style and to introduce features drawn from the styles of Greece and Rome. In the façade of Saint-Etienne du Mont, of the beginning of the sixteenth century, we see this mingling of the styles. There is a Romanesque tower, a Gothic rose-window with a Grecian colonnade and pediment. After the completion of St. Peter's at Rome it became the fashion for a couple of centuries or more to build churches of a domical structure, like St. Peter's. Such are the churches of the Sorbonne, the Invalides, the Panthéon of Paris and many others. The Grecian colonnade and pediment coupled with the Roman dome are the striking features of the churches throughout the period known as the Classical in literature. The very word Gothic became a synonym for barbarous. Nothing was in good taste that was not of Grecian origin. This is one of the most striking phenomena in the history of art. The men of the Renaissance did not cast aside the Gothic style and adopt the Classical because the latter was intrinsically more artistic. Indeed, it is doubtful if it was so. They really rejected the Gothic and adopted the Classical because, under the charm of the superior Classical philosophy and poetry, they rejected their own mediæval literature and, along with it, what was no part of it, their mediæval architecture.

The church of the Madeleine of the year 1807 represents a new phase of development. It is true that it was intended by Napoleon not as a Christian church but as a temple of glory, and so could be fashioned more appropriately after the model of a pagan edifice. But that is not the only reason for its being an almost exact copy of a Grecian temple. It is easy to see by comparing, for instance, Saint-Etienne du Mont (1517) with the Panthéon (1764) that originality of design was waning. The Madeleine marks the close of the eras of invention and the beginning of the era of imitation. It is a far cry from the free spirit of inventiveness which produced a façade like that of Reims to the spirit of imitation which produced the colonnade, however beautiful, of the Madeleine. The nineteenth century is the age when men are more anxious to secure historical accuracy than to invent bold, striking novelties. The field from which to choose models has been very much widened, however, since the Romantic movement of 1830. Hugo and his contemporaries turned their attention to mediæval art and rediscovered, so to speak, the Gothic cathedral. That graceful form became again an object of admiration, and architects took it as a model for modern structures. But Romanesque and Classical models are not excluded. In fact, nearly all types of buildings are copied in our time. The two great characteristics of modern architecture are variety of style and, what may seem paradoxical, lack of originality.

CANADIAN SOLDIERS' MEMORIALS.

With regard to this subject, Mr. A. T. Taylor, F.R.I.B.A., Montreal, writes as follows:

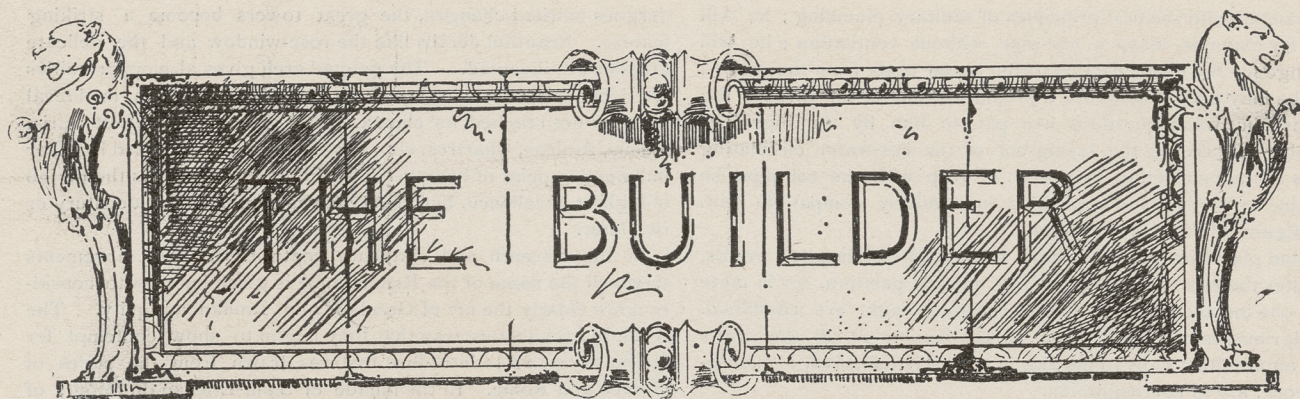
"I am heartily in sympathy with the project of erecting permanent memorials of the Canadian contingents who did such splendid work in South Africa in all the chief centres. Such deeds should be commemorated as an incentive for ourselves and for our children. The form you suggest for Toronto, viz., a triumphal arch, is particularly suitable, as not only following the precedent of great nations of the past, but also as being always a striking architectural feature in any city. In New York the temporary "Dewey" arch is still standing and is universally felt to be a high sounding clear note in the architectural discord of that city."

THE ONTARIO ASSOCIATION OF ARCHITECTS.

The formal opening of the new rooms which have recently been fitted up to serve as the headquarters of the Association, was celebrated by a dinner held in the Assembly Room on the evening of the 11th inst. There were present about fifty members and invited guests. The chair was occupied by the President, Mr. A. F. Wickson, having on his right the Rev. Professor Clark and on his left Professor Galbraith, Principal of the School of Practical Science. The principal feature of the occasion was an interesting address on "Architecture," by Professor Clark, a synopsis of which we hope to have the privilege of publishing in a future number. The new rooms have been partially furnished and already present an attractive appearance. The furniture in the architects' rooms was specially designed by members of the Association. It is the purpose to hold monthly meetings of the Association at which papers and discussions will form the principal feature. The rooms contain the Association Library and other interesting literature, and will be open at all times to members.

It is proposed to postpone the Convention of the Ontario Association of Architects until the 29th and 30th of January, the same week as the Architectural Exhibition of the Eighteen Club.

*Abstract of a lecture delivered on November 19th before the Modern Language Club of University College, Toronto.



[THIS DEPARTMENT IS DESIGNED TO FURNISH INFORMATION SUITED TO THE REQUIREMENTS OF THE BUILDING TRADES. READERS ARE INVITED TO ASSIST IN MAKING IT AS HELPFUL AS POSSIBLE BY CONTRIBUTING OF THEIR EXPERIENCE, AND BY ASKING FOR PARTICULAR INFORMATION WHICH THEY MAY AT ANY TIME REQUIRE.]

Some Hints for
Mill men.

MILL men are often called upon to get out stuff of various kinds for which no provision has been made for working out with the machines at their command. With a

work that can be produced, and in case an ornament or a different number of sides from 4 to 8 is desirable, the gain shown and the block may be made to suit. The manner of operating is shown at Fig. 2, when the saw is forming the cross ornament. It is necessary the block should have as many sides as the desired ornament, and that the gain be made to fit the block. It is

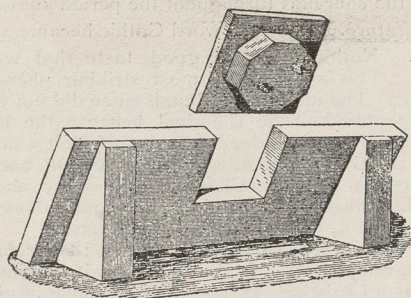


FIG. 1.—ATTACHMENT TO BAND SAWS, FOR SAWING ORNAMENTS.

band-saw, and the attachments illustrated herewith, a great variety of ornamental blocks may be produced, some of which are shown in the illustrations presented at Fig. 3. The attachment shown at Fig. 1, which is made of wood, and which any mechanic can make, has

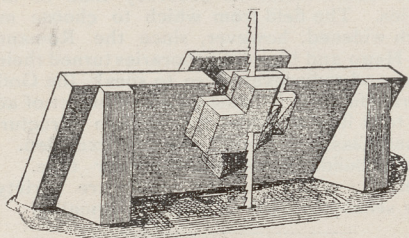


FIG. 2.—ATTACHMENT IN OPERATION.

been used in some shops many years, and in some localities the ornaments produced by it have become quite popular for a variety of purposes. The attachment as shown at Fig. 1 may be made to cut at any

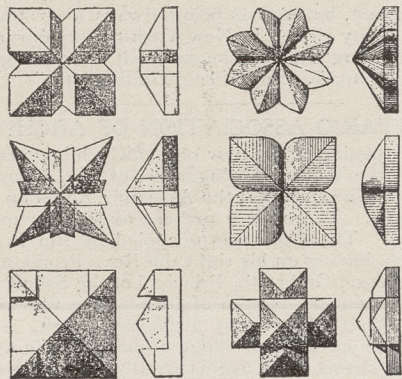


FIG. 3.—SPECIMENS OF WORK PRODUCED BY ATTACHMENT.

angle, but if made to cut at 60 degrees it will be found as useful as any perhaps. By its use hundreds of designs can be produced, the variety being limited only by the taste and skill of the operator. The few examples shown at Fig. 3 give some idea of the character of the

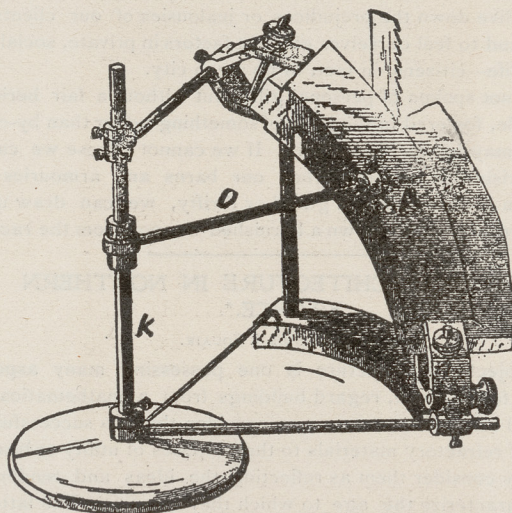


FIG. 4.—BAND SAW ATTACHMENT FOR SAWING CIRCULAR RAILS.

evident from the foregoing that many designs of center ornaments, rosettes, head-blocks, etc., that have been hitherto cut or carved by hand, may be readily and expeditiously sawn on either a scroll-saw or a band-saw. The size of the device is not material. It should, however, be proportioned to the size of the work to be done.

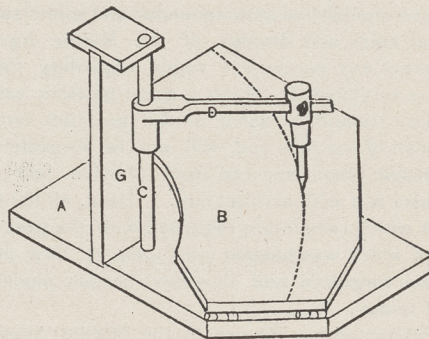


FIG. 5.—A SIMPLE DEVICE FOR MARKING OFF A RAIL.

For example, for a 3-inch rosette it would be well to make Fig. 1 about one foot long and four inches high. The gain in the inclined piece should be about $2\frac{1}{4}$ inches square and the block should fit neatly in the gain of the inclined piece. The gain and the block may be square or semi-circular. The following direction will indicate how the attachment is to be used: Cut the face figure of the ornament first, then fasten it to the block by means of wood screws as shown. Drop the

block into the gain in the inclined piece, first laying off the edges as they are to be sawn. It will be noticed in the accompanying sketches of work that the edges are all simply gauged an equal distance from the back. This, however, can be varied sometimes with good effect. The skilful operator will evolve many designs of ornament not even suggested in this brief description when he becomes accustomed to the method of working the attachment.

Cutting Circular Rail With Band-saw.

To make a hand-rail for a circular stairway has always been considered quite an achievement for the ordinary joiner to perform, though the expert finds no trouble in laying out and completing the work. The device shown at Fig. 4 was invented so that the process of forming such a rail might be simplified. This device as here presented was patented in the United States many years ago, but it seems never to have come into general use for some reason or another. The plank from which

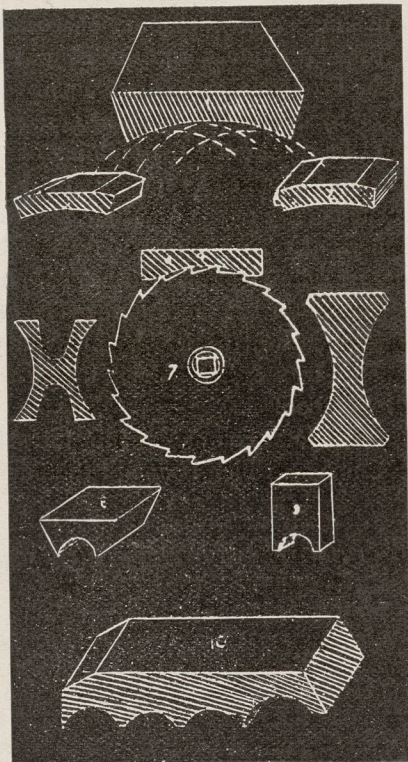


FIG. 6.—SAWING COVES.

the rail is to be made is set up to the pitch of the stair, and the marker O which slides up and down the standard K makes the lines where the plank is to be cut for the rail. The pencil or scribe is fastened in a socket at A, the socket being moveable on the arm so as to be available at any point within the limit of the arm. The principle is an old one, in fact, as old as the works of Langley, Paine or Moxon. Another device for laying out a rail is shown at Fig. 5 which may be attached to a band-saw or to scroll saw. This machine is much simpler than the previous one. It may all be made of wood by any skilful mechanic. A shows the base of the machine, B, an inclined board which may be hinged to the base plank. A, C, is a standard with a cap through which a rod G is fixed. The standard C carries a moveable arm D, which has a slider carrying a pencil attached. This pencil-holder slides along the arm D, in order to suit the diameter wanted. When a pattern for the rail is to be made the hinged board B is raised to the pitch of the stairs, and the pencil point is moved until the proper diameter is reached, when a line like the one

dotted is drawn. The inside line is also drawn when the paper or board on which the lines are drawn, are removed and the curver transferred to the plank to be cut. The plank is then cut by the band-saw or the scroll saw, while the plank is set up on a rake which is the pitch of the stairs. By this method the proper curve and

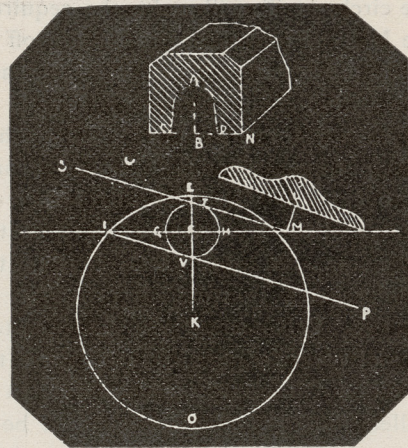


FIG. 7.—ARRANGING SAW GAUGE.

the correct bevels are obtained; two very important items in hand-rail construction.

THE form of outline of the slot or groove made by a circular saw not only depends on the size and the position it occupies on the saw arbor, but on the direction the material being worked is also moving. If we take a block of wood and move it across the bench lengthwise, the saw will simply cut a slot the width equal to the set, and the depth depending on the height of the table above the saw arbor. If we drive a block at right angles, or square across the saw table, a groove will be formed, having a cross section in the shape of a segment of a circle; any other direction will give a similar part of an ellipse. In Fig. 6 is shown a variety of work cut out on this principle. No. 1 is a

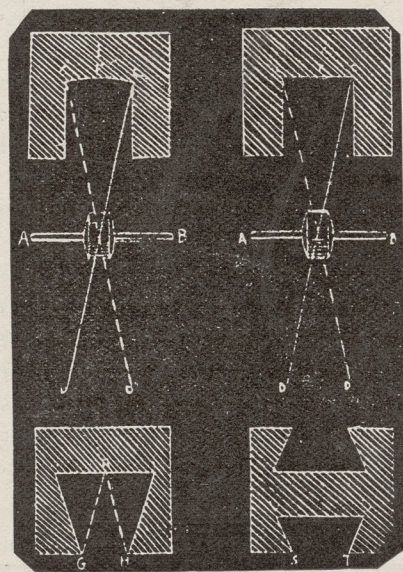


FIG. 8.—SAWING GROOVES AND DOVETAILS.

block cut out for lagging a pulley, or similar work; the other figures show various patterns, all of which may be cut out with a circular saw. When it is required to cut a circular groove of a given size at a saw bench, the table can be raised and the saw gauge set to the proper angle by means of the diagram shown in Fig. 7. If it is required to groove out the

block A to the line C A D, on the saw bench, using a twelve inch saw, first draw the circle E M D, twelve inches in diameter, the same as the saw, then lay off on the radius E K, E F, equal to A B, and draw a line at right angles for the surface of the table. With F for the center draw the circle T H V, equal in diameter to C D. Now the line passing through M, and touching the circle at T, will make the required angle with the line M I. From the point M, lay off at right angles to S M, M L, equal to D N; set the saw gauge at this point, with the angle already found, and the saw bench is ready for the work. The teeth of the saw, for this purpose, should be very coarse, and filed so as to cut the whole length of their sides as well as their points. If three or more of the teeth could be made shorter than the rest, and at the same time given more set, it would improve its working qualities greatly. When the saw is fastened to the arbor by means of two wedge shaped collars, the same will "wobble" or "stagger", and will cut a groove, having parallel sides, but the bottom will be concave in sections, as shown in the first diagram in Fig. 8. This can be made to give a flat bottom to the groove by jointing the saw while in motion, as shown in the second figure. By setting the saw off from the center, one corner of the groove will be made deeper than the other, but the sides will remain parallel. A dovetailed shaped groove may be made by tilting the stuff first on one side, and afterwards on the other, specimens of the dovetailed groove are shown in the lower sketches. Door stiles and door rails may be plowed for the panels by "wobbling" the saw as shown, and the panels get a better "grip" when fitting in a sawn groove. The size of the groove may readily be obtained by the proper adjustment of the bevelled washers; they can be turned on the arbor to give the saw the proper angle, and when the right position is once found, the washers and the saw can be marked, and the same adjustment can be made with little trouble when the same size of a groove is wanted. The bevel washers may be made of hardwood—maple being about as good as any—and one pair of washers may be used for several sizes of grooves. The washers, if made of wood, should fit loosely in the arbor and should be true on both face, and each should be the exact counterpart of the other. In fact, it is better, when making the washers, to make the two out of one piece of stuff, boring the hole first, and then sawing them across the hole to the proper bevel. The iron collar and outside washer must be retained on the mandrel. The first bevel washer fits against the collar, then the saw is run on, then the round wooden washer, with its thick end opposite to the thin end of the first washer, then the rim washer, which must be followed by the tightening nut. The saw will then stand at an angle with the mandrel, and this is the object attained.

The Hanover Portland Cement Company are enlarging the capacity of their works from 200 barrels to 300 barrels per day.

PROMINENT CONTRACTORS

MR. J. B. MCMANUS.

One of the best known contractors of late years in the Maritime provinces is Mr. J. B. McManus of Memramcook, N. B., who has become particularly known as a builder of sub-structures in bridge work, and who has been handling large contracts of a general character though he seldom now turns his attention to the erection of buildings.

Mr. McManus was born in Memramcook in 1846 and is a son of Terrance McManus, a native of the north of Ireland who settled in New Brunswick when about twenty years of age, and who for some years with his sons did business under the name of T. McManus & Sons.

For some twenty years previous to 1894 J. B. McManus and his brother J. W. McManus were the only members of the old firm. At that date they dissolved the partnership and each is now doing business under his own name.

Mr. McManus does a large amount of work throughout the Maritime provinces and in New Brunswick especially for the Provincial and Dominion governments.

Among the many contracts handled during the last few years might be mentioned the building of two large breakwaters in the summer of 1899, one in Kings and one in Shelburne county; also one that cost \$20,000 in Guysboro county. In company with other well known builders, who formed with him the firm McManus, Lowe & McManus, he aided in the construction of the big under blast and open hearth furnaces at Sydney, C.B., for the Dominion Iron & Steel Co., the cost of which approximated \$60,000.

Mr. McManus is just completing for himself a residence in Memramcook which is one of the finest in that section.

METHOD OF FINDING DIRECTION OF JOINTS IN ELLIPTICAL ARCHES.

EDITOR CANADIAN ARCHITECT AND BUILDER:

DEAR SIR,—Your diagram Fig. 1 in this month's BUILDER showing the manner of finding the direction of joints in semi elliptical arch, is not correct. The tangent as shown, or at least a line parallel with a tangent, is all right when applied to circles, but wrong in a semi ellipse. The most practical way to correctly draw those points when a semi ellipse has been drawn with a string is to draw lines from the foci to the point where the joint is required and bisect the angle thus obtained, which will be the correct joint.

JOHN HANRAHAN.

ANSWER.—Theoretically our correspondent is quite right, but his method is not in general use among bricklayers as it takes too much time to obtain the correct lines, and the method shown in Fig. 1, November issue, is often employed instead because of its quick application, and it is approximately correct. Most so-called elliptical arches are simply semi-ovals, being composed of segments of circles, and the rule given applies to such arches with correct results.

The coroner's jury at Ottawa charges the city building inspector with dereliction of duty in allowing an imperfect wall to remain standing. The falling of the wall recently caused the death of two persons.

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AGENTS FOR CANADA

BUILDING MATTERS IN PRINCE EDWARD ISLAND.

[BY A TRAVELLING CORRESPONDENT]

In the last year building operations have been a good average in Prince Edward Island, though at the beginning of the year the prospects seemed very poor. A very good class of larger buildings has been erected, including a number of churches and other public buildings.

There are a few fairly important works now in process of completion, and large buildings will be proceeded with next year.

Business in most other lines has been prosperous and trade have been brisk. On the western end of the Island the construction of the new railroad, which is to extend eastward across the river from Charlottetown, involving a large expenditure for a bridge, which is over a mile in length, will mean a great outlay in money on the Island, and must surely tell much building construction apart from the railway. Tenders for this railway work have already been closed, and spring will see construction begin.

An Engineer has for some time been engaged inspecting quarries located along the Northumberland Straits between here and Newcastle, N.B., in the interests of M. J. Haney of Toronto, contractor for the sub-structure of the Hillsboro Railway Bridge near Charlottetown. The stone may be purchased from some quarry, a quarry may be bought out, or if a suitable location be found, a new one may be established; about 60,000 yards of stone may be required. The contractor is now getting his materials on the ground, and construction will begin as soon as navigation opens. The bridge and approaches is 4500 feet over all, having 13 piers and abutments, the 14 spans being 210 feet each. The depth varies to 60 feet, piers resting on piles or caissons. The bridge will be 25 feet above water. The sub-structure is to be completed in two years. Mr. Haney is of Toronto, and was one of the firm of Hugh Ryan & Co., who built the Sault St. Marie canal.

The Roman Catholic Church at Souris now under construction by contractors Duffy & McEachern, under W. C. Harris, architect, is of stone and will cost about \$30,000. Souris stone is being used, which is of a reddish brown color. The walls are now raising, and the building is to be completed next October.

Few residences were erected in Charlottetown this year. All were of wood and were not expensive. Of public buildings in the city, some in particular should be noted.

The Prince of Wales College from plans by C. B. Chappell is of brick and stone from the Stevenson quarry in Wallace, N.S., with slate roof, size 132x80 with full basement and of two stories. The structure cost about \$40,000.

The Prince Edward Island Hospital, recently completed under the same architect is of brick and stone, size 125x40 with a number of small ells. The main building is of three stories. There are 25 beds, public wards and 10 private rooms. The cost was \$20,000.

The Brown dock built last year under C. B. Chappell is of brick with stone front. Size 80x70, 3 stories and cost \$15,000.

The new Christian Church just completed by H. & S. Lowe, contractors, is of brick and stone, is not very large and cost about \$5,000. Its erection was begun in the summer under W. C. Harris, architect.

An addition to the Hotel Davis, size 60x40, five stories cost \$10,000. This was done last summer, C. B. Chappell, architect.

The addition of a large brick and stone wing to the Lunatic Asylum in Charlottetown is still being proceeded with, but is nearly finished. This wing is of size 200x40, three stories and basement, and is from plans by C. B. Chappell, architect. Wallace finstone was used. The cost is about \$35,000.

The only large building, the erection of which is settled upon for the spring in Charlottetown seems to be the Derbrisay Co. block on Queen and Grafton streets. This is to be of stone and brick, size 40x60, and of three stories, to cost \$10,000. W. C. Harris, architect; H. & S. Lowe, contractors, will start the job at once and proceed through the winter.

The new Sinclair and Stewart departmental store being constructed in Summerside by Messrs. Sherman & Lefurgy of that town, from plans and under supervision of C. B. Chappell, Architect, is taking shape as one of the finest structures on the Island. It is brick with front of brick and stone. Size 106x46, with a vault and elevator addition at the back of 10 feet depth. It is three stories in height with a large basement. The building compares most favorably with the big Holman departmental store block beside which it stands. It is to be finished early in the spring.

Messrs. Schurman, Lafurgy & Co., an old firm located in Summerside do a large business, and have a large plant in operation in that town. Recently they have taken many large contracts in Sydney, C.B., and now have quite a plant established there.

The Mechanics' Manufacturing Co., general contractors and builders, are doing a large portion of the Island trade now. The firm was organized and began business in Summerside four years ago. They have now large factory buildings, comprising a main shop of two stories, 60x50 with one ell of 25x30, and another of 35x30, in addition to large dry kilns, furnace and engine rooms, etc. The firm imports lumber, including all that they require for their own use, and now they have some \$8,000 worth of stock on hand. The past season has been a busy one with them. Among other buildings erected this year by them, are:—St. John's Anglican Church in Milton, and the Indian River Roman Catholic Church, which are not yet finished. The latter is of wood, size 117x65, and will cost from \$12,000 to \$15,000.

C. B. Chappell, architect, of Charlottetown, made the plans and supervised the large new Halifax Herald building now being erected. His plans for the Sydney Academy in Cape Breton, made in competition, were accepted and the building was begun last August. Its size is 106x75, two stories and basement. Messrs. Schurman & Lefurgy, of Summerside, have the contract at \$30,000. The building, which is of brick and stone, will probably cost about \$40,000.

Mr. W. C. Harris, architect, for many years in Charlottetown, is now located at Halifax. Besides the church at Souris, he made the plans of several wooden Roman Catholic Churches now being erected on the Island.

Since its organization only eighteen months ago the British Fire Prevention Committee has made sixty-three tests of materials as follows: Fire-resisting floors, twelve; ceilings, two; fire-resisting partitions, nine; different forms of wood and iron doors, twenty-three; various forms of glazing, eight. Besides this there have been several odd tests with treated wood, fire curtains, fire blinds, girder coverings and safes.

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QUANTITIES OF MORTAR REQUIRED FOR BRICKWORK.

VANCOUVER, Nov. 24th, 1900.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—In an article in the CANADIAN ARCHITECT AND BUILDER for October last, under the heading of "Quantities of Mortar Required for Brick per M" (page 196) it is stated that for a joint of $\frac{1}{4}$ to $\frac{3}{8}$ in. brickwork, it will require 4 to 5 cubic feet of mortar to 1 M bricks, or say an equivalent of 2 feet 6 inches per cubic yard.

In the CONTRACT RECORD of Oct. 17th, page 4, under the heading of "Brickwork" it is stated that one cubic yard of mortar will lay 80 feet of brickwork, or three cubic yards. Now a third of a cubic yard of mortar is 9 feet, that is equivalent to 9 cubic feet of mortar to one cubic yard.

Result—Author of article in CANADIAN ARCHITECT AND BUILDER, 2 feet 6 inches of mortar to 1 yard of brick. Author of article in CONTRACT RECORD, 9 feet of mortar to 1 yard of brick.

If the editor will kindly give some accepted authority on this question it might be the means of preventing some beginner from being led astray by one of the above contradictions.

Yours very truly
THOS. BRADBURY.

[With regard to estimating the amount of mortar required to lay a cubic yard of brick-work, authorities seem to differ; this disagreement is, doubtless due to the fact that the sizes of bricks differ, some being made 8 inches long by 2 inches thick and 4 inches wide, while others are $9 \times 4\frac{1}{2} \times 2\frac{1}{2}$ inches. The smaller the bricks the greater number of joints, and consequently a larger amount of mortar will be required. For ordinary sized Canadian bricks, five tiers make one foot in height, therefore it requires 15 bricks to make one yard in height. This requires 15 joints, one quarter of an inch thick of mortar; in other words we have 15 horizontal joints a quarter of an inch thick and 3×3 feet area, in one cubic yard of brick-work. This would make a mass of mortar $3\frac{3}{4}$ inches thick, and 3 feet x 3 feet. Then we have 12 vertical joints in a cubic yard of brick-work, which also measure $\frac{1}{4}$ inch by 3 feet 3 feet each, which

gives another mass of mortar 3 inches thick by 3 feet x 3 feet, less, of course, the thickness of the total horizontal joints, which will be allowed for waste etc., in this estimate. Now we have a mass of mortar as follows: $3\frac{3}{4}$ inches x 3 feet x 3 feet for horizontal joints, and 3 inches x 3 feet x 3 feet for vertical joints, or a total of $6\frac{3}{4}$ inches x 3 feet x 3 feet for the amount required to lay a solid cubic yard of brick-work. According to this estimate, which gives three joints extra for waste, etc., it requires about $4\frac{3}{4}$ cubic feet of mortar to lay one cubic yard of brickwork, but as this estimate does not make deductions for voids in slack joints, cross joints, etc., it must be evident the estimate is in excess of the requirements, though it is best when estimating to allow for the larger quantity.

Quoting an American authority on the subject (Trautwine) we get the following:

THICKNESS OF JOINTS	PROPORTION OF MORTAR	NO. OF BRICKS PER CUBIC YD.	NO. OF BRICKS PER CUBIC FT.
$\frac{1}{8}$	About 1-9	638	23.63
$\frac{1}{4}$	" $\frac{1}{4}$	574	21.26
$\frac{3}{8}$	" 3-10	522	19.33
$\frac{1}{2}$	" $\frac{1}{3}$	475	17.60
$\frac{5}{8}$	" 4-10	433	16.04

As these figures are based on bricks measuring only $8\frac{1}{4} \times 4 \times 2$ inches the amount of mortar required to lay a cubic yard is manifestly greater than would be necessary to lay a cubic yard with Canadian bricks.

An English authority (Seddon) tells us that it requires to lay a cubic yard of brickwork " $\frac{1}{8}$ of a yard of good lime and a quarter of a yard of sand."

Professor Ira Baker in his "Treatise on Masonry Construction" says, "1 cubic yard of mortar will lay from 67 to 80 cubic feet of brickwork," and "from 90 to 108 cubic feet of brickwork with $\frac{3}{8}$ to $\frac{1}{4}$ inch joints." This rule is also quoted in Kidder's Building Construction and Superintendence.

From the foregoing it will be seen that authorities differ somewhat, but to Canadian estimators the first figures presented in this article, namely, $4\frac{3}{4}$ cubic feet of mortar for each cubic yard of brickwork will be nearer the correct thing than either the English or American rules, that is to say, that from 0.25 to 0.30 cubic yards of mortar will be sufficient to lay one cubic yard of Canadian bricks.—THE AUTHOR OF THE ARTICLE.]

[NOTE.—The article in THE CONTRACT RECORD to which reference is made by our correspondent, was republished from the St. Louis Builder. — Editor C. A. & B.]

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BUILDING MATTERS IN VANCOUVER.

The annual election of officers of the Vancouver Builders' Exchange was held recently. Only two changes were made in the personnel of the Board of Directors. Mr. W. Hepburn, succeeded Mr. C. T. Shindler as Vice-President and Mr. D. M. Fraser is replaced by Mr. R. P. Forshaw.

The Exchange cannot be said to have prospered during the year to the extent which was anticipated. In the opinion of some of the older members, a mistake was made when the annual fee was reduced to \$25.

The change resulted in bringing in a member of new members, many of whom appear to have looked only for immediate personal benefits in return for their investment, forgetting the advantage which must accrue to all if by united effort trade abuses can be remedied and the business of the builder placed on a more equitable and profitable footing. The proposition has been made to raise the membership fee, and profiting by past experience it is hoped that the affairs of the Exchange may in future be managed in such a way as to ensure a larger measure of success.

The effort to induce the architects to organize and work in harmony with the Exchange failed, as did also the movement to secure the adoption of a uniform contract.

The rainy season has set in and in consequence building operations will be conducted on a smaller scale until spring.

BUILDING AT OTTAWA.

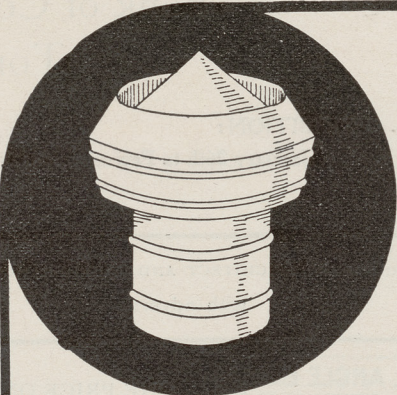
The following statistics show the character and extent of building operations in Ottawa during the building season which is about to close:

The number of solid brick or stone buildings or what may be termed first-class structures, erected during the year is 94, the estimate total cost being \$391,600, of these only 10 are below \$1,000, and but ten of \$10,000 and over, the highest being \$50,000. The great bulk, or 74 of the buildings, range from \$2,000 up to \$6,000 in cost.

Of second class buildings known as brick veneered structures there have been erected 187 at a total cost of \$280,450. Of these 27 are placed below \$1,000, and six at over \$3,000, being in all cases blocks of several houses or stores, leaving 154 buildings erected at an average of \$2,000 each.

The local architects state that very little work has come to them as the result of the great fire which destroyed a large portion of the city early in the year. The burned district did not include the business section of the city. The buildings destroyed were principally wooden houses of a cheap character. These have been replaced by structures of a little better description, but such as only called for the services of the local builder.

The Danish Elevator and Hoist Regulations provide, among other things, that the car must be suspended by at least two ropes or chains each of which must alone be strong enough to carry ten times the weight of the car fully loaded.



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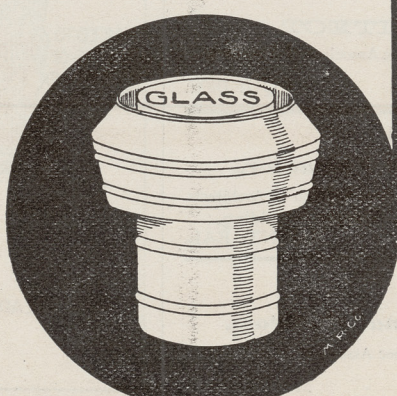
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PERSONAL.

I. S. Russell, architect, Stratford, Ont., who has been ill for some time is now convalescent.

Mr. Frederick F. Saunders, architect, has recently opened an office at No. 45 Lippincott Street, Toronto.

Messrs. W. A. Langton and Gregg & Gregg, architects, have recently removed to new offices at No. 94 King Street West, Toronto.

Messrs. Sproatt & Rolph, architects, Toronto, will shortly remove from the Bank of Commerce Building to more commodious offices at No. 94 King Street West.

Mr. W. T. Dalton, architect, of Vancouver, B. C., is about to leave for England, on a vacation. He proposes to spend the greater part of the winter in the old land.

Mr. W. A. Langton recently delivered lectures on various phases of architectural education and work before the students at the Normal School, Toronto, and the members of the School Art Leagues.

Mr. A. Gobeil who entered the Department of Public Works at Ottawa in the year 1872, and has for a number of years past occupied the position of Deputy Minister of Public Works, has made application for superannuation. Mr. Gobeil has been a most efficient public officer.

PUBLICATIONS.

In order to disseminate as widely as possible a better knowledge of explosives and their employment and thus reduce the risk and promote efficiency of blasting operations, the Toronto Bureau of Mines has just issued a pamphlet of 136 pages dealing with this important subject. The author is Prof. Courtenay DeKalb of the Kingston School of Mining, who is also Inspector of Mines for Eastern Ontario. The Commissioner of Crown Lands is taking steps to place a copy of this work in the hands of every mine and quarry manager, captain and foreman in Ontario, free of charge, in the hope that a perusal of its contents may lead to a diminution in the number of accidents resulting from the use of explosives. Other persons may procure a copy for the nominal charge of 25 cents on application to Thos. W. Gibson, Department of Crown Lands, Toronto.

The Amherst Red Stone Quarry Co. have turned out material for a number of large and well known buildings the last few years, including the Baptist church in Amherst erected a few years ago at a cost of \$35,000; the handsome brick and stone Presbyterian church on the same street which was built last year at a cost of \$23,000; the new Bank of Nova Scotia now about completed in Sussex, N. B., (this building is entirely of dressed stone and it has been found that the Amherst red stone can be worked with great ease); the Merchants' Bank of Halifax in Truro and

the Roy building in Halifax contain this stone. It was used in the new Portland school house in St. John, and considerable has been sent recently to D. J. Leonys & Son, Granby, Que. The stone maintains its color well and hardens with exposure. The quarry which is just outside of Amherst is 150 feet in length and is now 40 feet deep. It is well fitted with lifting apparatus with engines of 60 h.p. It is under the management of Jas. Donald of Amherst.

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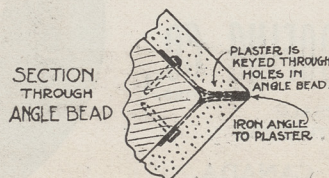
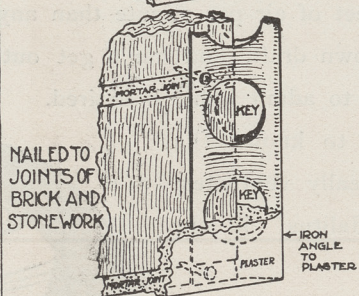
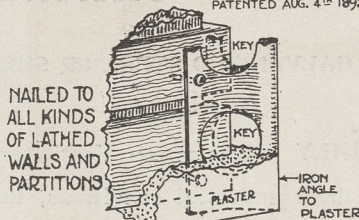
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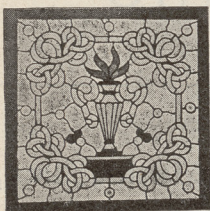
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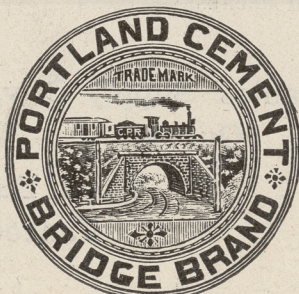
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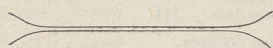
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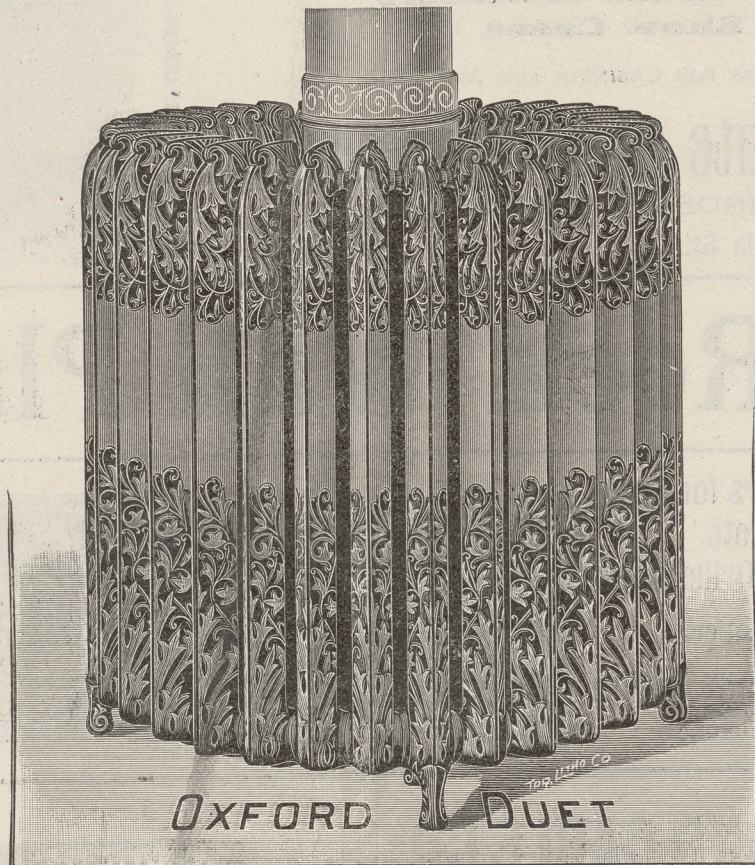
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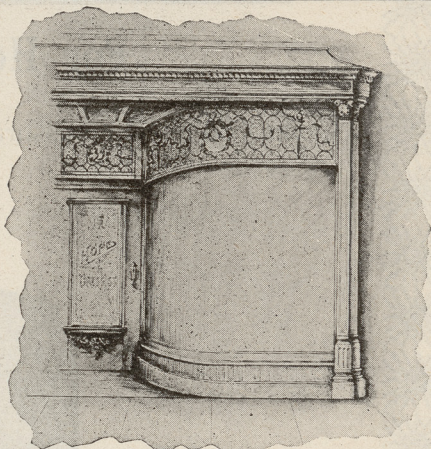
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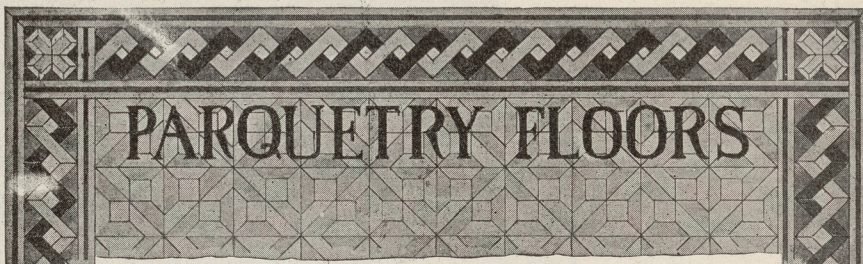
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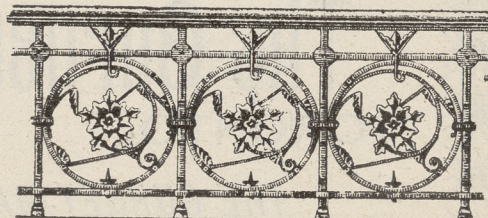
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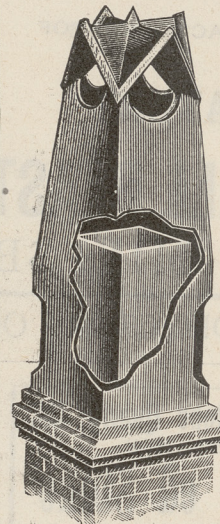
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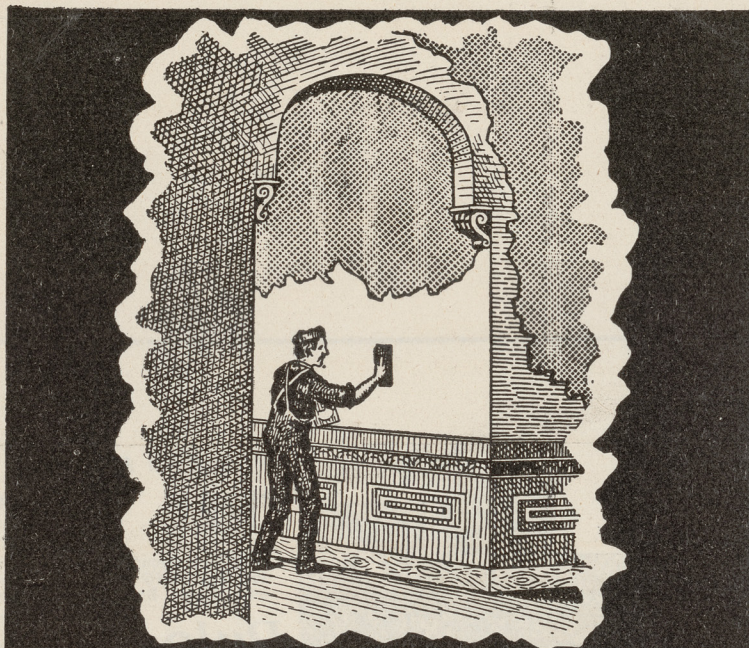
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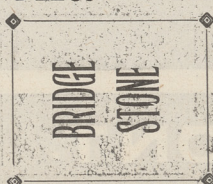
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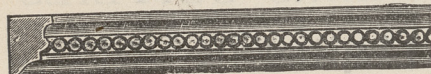
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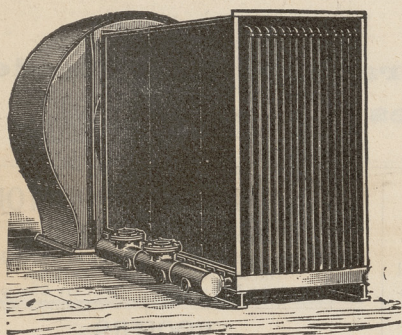
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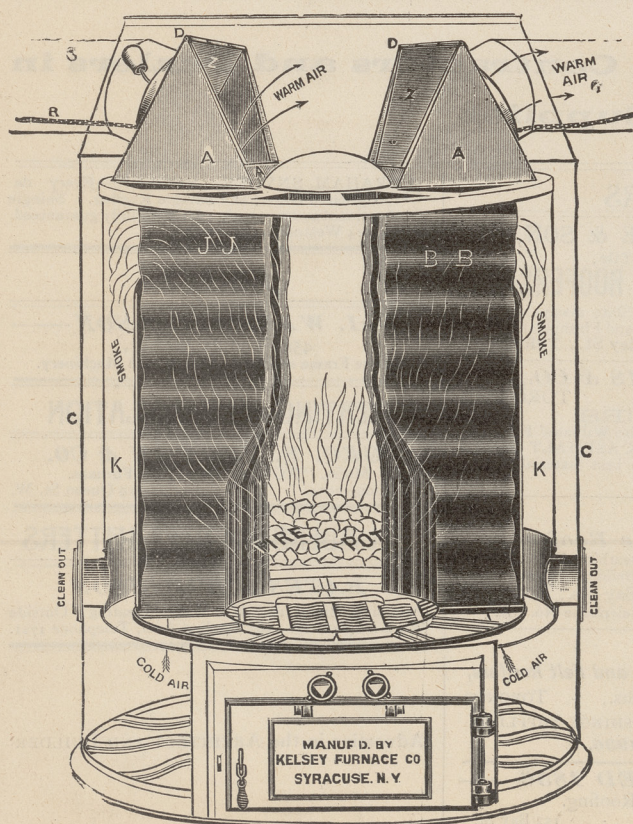
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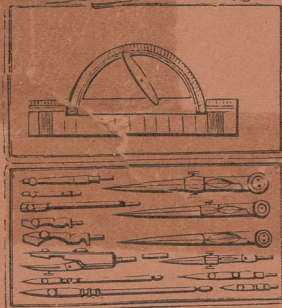
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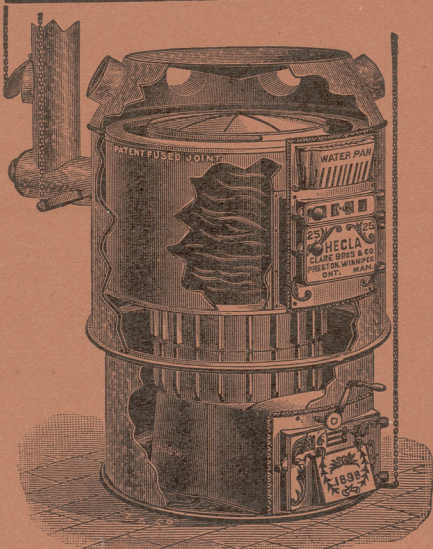
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